

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF PUERTO RICO

CENTER FOR BIOLOGICAL
DIVERSITY, ET AL.,

Plaintiffs,

v.

NATIONAL MARINE FISHERIES
SERVICE, ET AL.,

Defendants.

Civil No. 12-1281 (SEC)

OPINION AND ORDER

Before the Court are the parties' cross-motions for summary judgment (Dockets # 44 & 47), and their consolidated response and reply memoranda. Dockets # 51 & 53. After reviewing the filings and the applicable law, each party's motion is **GRANTED in part and DENIED in part**.

Factual and Procedural Background

Members of the Acropora family, elkhorn and staghorn (collectively, Acropora or Corals) are two of the major reef-building corals that inhabit the Caribbean. Yet in the past three decades their populations have declined at an alarming rate, so in 2006 they were listed as "threatened species" under the Endangered Species Act of 1973 (ESA), 16 U.S.C. § 151 et seq. This dispute centers on the scope of the protections the ESA confers on Acropora.

Algae growth adversely affects elkhorn and staghorn. And in an interesting glance at the cycle of life in the U.S. Caribbean, it turns out that parrotfish — and to a lesser extent, surgeonfish — have become ecologically significant to Acropora: They graze algae and mitigate the spread of algae cover. Further distorting this balance, overfishing of parrotfish increases, at least minimally, the persistence of macroalgae thereby injuring, to some extent, the Corals. Thus shaped by the delicate but arresting ecological interrelation between Acropora, algae, and herbivorous fish, this ESA action showcases the myriad challenges that arise when federal environmental law and complex fishery regulations meet at the frontiers of science.

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The Center for Biological Diversity, “a non-profit organization that is actively involved in species and habitat protection issues throughout the United States,” Docket # 44-4, and related plaintiffs (collectively, Plaintiffs) bring this suit under the judicial review provisions of the Administrative Procedure Act (APA), 5 U.S.C. § 706.¹ The defendants (Defendants) are the Secretary of Commerce, and the National Marine Fisheries Service (NMFS), the federal agency in charge of the management, conservation, and protection of living marine resources within the U.S. Caribbean’s Exclusive Economic Zone (EEZ).² In a nutshell, Plaintiffs challenge NMFS’s recent agency action on the Reef Fish Fishery of Puerto Rico and the U.S. Virgin Islands (Fishery), arguing that it jeopardizes Acropora and adversely affects their critical habitat, thereby contravening the ESA.

Under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), 16 U.S.C. §§ 1801-1884, the Caribbean Fishery Management Council (Caribbean Council), along with NMFS, regulates the commercial and recreational harvest of Caribbean reef fish, including parrotfish and surgeonfish. It does so primarily through the Caribbean Fishery Management Plan (Fishery Plan). Now, the Magnuson-Stevens Act was recently amended by the Magnuson-Stevens Fishery Conservation and Management

¹The other plaintiffs are (1) “Coralations,” an “award-winning” coral reef conservation organization based on Culebra, Puerto Rico, Docket # 32, p. 5; and (2) Mary Adele Donnelly, who is “particularly concerned about the precarious status of elkhorn and staghorn corals and the reef systems of which they are a part “because those corals and reefs provide vital habitat and protection for hawksbill sea turtles.” *Id.*, p. 8. The ESA authorizes citizen enforcement suits, allowing anyone to file a civil suit “to enjoin any person, including the United States and any other governmental instrumentality or agency . . . who is alleged to be in violation of any provision of [the ESA] or regulation issued under the authority thereof” 16 U.S.C. § 1540(g)(1)(A). Plaintiffs’ standing to bring this ESA suit is undisputed.

²NMFS is part of the National Oceanic and Atmospheric Administration (NOAA), and the Department of Commerce, whose Secretary is the other, named defendant in this case. For ease of reference, the Court will collectively refer to the Secretary of Commerce and NMFS — to whom the Secretary has delegated her authority over Acropora — as “Defendants.” *See, e.g., Animal Welfare Inst. v. Martin*, 623 F.3d 19, 26 n. 9 (1st Cir. 2010).

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Reauthorization Act of 2006 (Reauthorization Act), Pub. L. No. 109-479, 120 Stat. 3575 (2007), which “introduced a suite of stringent protections for depleted fisheries.” Lovgren v. Locke, 701 F.3d 5, 12 (1st Cir. 2012)

The present dispute is an offshoot of the Caribbean Council’s adjustments to the Fishery Plan. As mandated by the Reauthorization Act, the Caribbean Council proposed several important changes to the Fishery Plan. The process ultimately resulted in NMFS’s adoption of the proposed changes, and its subsequent issuance of final regulations to implement what became Amendments 5 and 6 to the Fishery Plan (collectively, the “Amendments”). NMFS’s decision to promulgate the regulations implementing the Amendments was supported by a 2011 biological opinion (the “BiOp”) that concluded that the proposed action will neither jeopardize the Corals’s continued existence nor adversely modify their critical habitat in the U.S. Caribbean. See AR 10415.³

Disagreeing with these conclusions, Plaintiffs have mounted a comprehensive legal challenge at the BiOp’s conclusions. Because some of its determinations are capricious and arbitrary, Plaintiffs maintain, the BiOp violates the ESA and APA. See generally Docket # 32.⁴ Broadly speaking, Plaintiffs claim that Defendants’ reliance on the BiOp violates their duty to Acropora under the ESA of avoiding (1) the “likelihood of jeopardy” to the existence of the Corals; and (2) an “adverse modification” of their critical habitat. Id. ¶ 2. They request, among

³The court will cite to information contained in the administrative record as “AR ____,” and in the supplementary record as “Supp AR ____.” Although, as required by the governing law, all facts are ultimately drawn from the record, the court incorporates into this opinion portions of the parties’ statements of material facts — which are, of course, properly supported by the record — under Local Rule 56(c). Given the technical and complex nature of this case, Local Rule 56(c) serves well one of its purposes here: Preventing litigants from “shift[ing] the burden of organizing the evidence presented in a given case to the district court.” Mariani-Colon v. Dep’t of Homeland Sec. ex rel. Chertoff, 511 F.3d 216, 219 (1st Cir. 2007).

⁴Docketed on January 30, 2012, the complaint was originally filed in the District of Columbia. Docket # 1. On April 16, 2012, Judge Reggie B. Walton granted Plaintiffs’ unopposed cross-motion to transfer the case to this district. Docket # 15. Once transferred, Plaintiffs were granted leave to file a Second Amended Complaint (Docket # 31), which they did on June 4, 2012. Docket # 32. As the Second Amended Complaint is the operative pleading, all allegations are drawn therefrom.

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other remedies, that Defendants be ordered to “reinitiate ESA Section 7 consultation on the Fishery and complete a new legally valid biological opinion by a date certain.” See, e.g., id., p. 39. To be clear, Plaintiffs do not directly challenge the merits (and hence the findings) of the regulations implementing the Amendments under the Magnuson-Stevens Act. Nor could they, because, as fully discussed later, they brought no suit under that statute. They instead question whether continued fishing under the Fishery Plan’s Amendments adversely affects Acropora to an extent that contravenes the ESA.

In due course, both parties filed and fully briefed cross-motions for summary judgment. Plaintiffs’ cross-motion for summary judgment contains — and the court will therefore only consider, see, e.g., Hainey v. U.S. Dep’t of the Interior, 925 F. Supp. 2d 34, 44 n. 8 (D.D.C. 2013) — four legal challenges. See Docket # 44, p. 2. First, Plaintiffs argue that Defendants failed to base their jeopardy and habitat modification determinations on the best available science and did not establish a rational connection between the facts found and the conclusions made. Id. Second, they aver that Defendants did not consider the Fishery’s cumulative adverse impacts in the context of severe existing threats to Acropora and their habitat. Id. Third, Plaintiffs contend that Defendants also failed to establish a meaningful trigger for reinitiating consultation on the Fishery’s effects should those effects exceed the level predicted by NMFS. Id. Finally, Plaintiffs posit that Defendants violated their substantive duty to ensure that the Fishery would not jeopardize Acropora or adversely modify their critical habit.

Defendants opposed each of these grounds. Docket # 45. In June 2013 oral argument was heard at the Plaintiffs’ behest (Docket # 58), while a certified copy of the complete administrative record was filed in August. Dockets # 61 & 62. For the reasons laid out below, the court agrees, in part, with both parties. The court concurs with Defendants that the first two assignments of error are meritless, but also agrees with Plaintiffs that their last two claims have merit, and that some of the BiOp’s conclusions therefore offend the ESA.

I.

Because this ESA action arises within the complex statutory and regulatory system governing the Fishery and Acropora, it is appropriate to begin with the relevant statutory framework.

A. Statutory Framework: The Magnuson-Stevens Act and the ESA

Over three decades ago, and because of the mounting concerns about depleted fisheries, Congress enacted the Magnuson-Stevens Act (also called Sustainable Fisheries Act) “to conserve and manage the fishery resources found off the coasts of the United States.” 16 U.S.C. § 1801(b)(1). The federal government, through the NMFS, exercises “exclusive fishery management authority” within the EEZ. *Id.* § 1811(a); see also note 2 above; Little Bay Lobster Co. v. Evans, 352 F.3d 462, 464 (1st Cir. 2003).⁵ To that end, the Magnuson-Stevens Act creates regional councils that are responsible for the sustainable management of fisheries. 16 U.S.C. § 1852(h).⁶

As noted above, the regional council with jurisdiction over the areas affected by NMFS’s actions is the Caribbean Council, which consists of the “Virgin Islands and the Commonwealth of Puerto Rico,” having “authority over the fisheries in the Caribbean Sea and Atlantic Ocean seaward of such States and of commonwealths, territories, and possessions of the United States in the Caribbean Sea” § 1852(a)(1)(D). Through the Fishery Plan (and amendments thereto), the Caribbean Council regulates Caribbean reef fishing, including parrotfish and

⁵The EEZ “extends the full 200 nautical miles permitted under international law and treaty.” Gen. Category Scallop Fishermen v. Sec’y, U.S. Dep’t of Commerce, 635 F.3d 106, 109 (3d Cir. 2011) (citing 16 U.S.C. § 1802(11)).

⁶The Magnuson-Stevens Act defines “fishery” as either “one or more stocks of fish that can be treated as a unit for purposes of conservation and management that are identified on the basis of geographic, scientific, technical, recreational, or economic characteristics, or method of catch,” or “any fishing for such stocks.” 50 C.F.R. § 600.10.

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surgeonfish. See id. § 1852(h)(1).⁷ The Caribbean Council is composed of state and federal fishery officials and other private individuals appointed by the Secretary of Commerce. See id. § 1852(a)-(b).⁸

The ESA, for its part, was enacted “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] a program for the conservation of such endangered species and threatened species.” 16 U.S.C. § 1531(b). In the landmark decision of Tenn. Valley Auth. v. Hill, 437 U.S. 153, 185 (1978), the Supreme Court made clear that federal agencies must “afford first priority to the declared national policy of saving endangered species.”⁹ In furtherance of its objectives, the ESA requires the Secretary to list threatened or endangered species and designate their critical habitat. 16 U.S.C. § 1533(c).¹⁰ Once a species is listed, several important protections apply.

⁷The Fishery Plan — like all fishery management plans — was prepared using scientific evidence, and is geared toward ensuring conservation of the fisheries. See id. §§ 1853-54. As relevant here, any proposed amendments to any fishing management plan must be submitted to NMFS for review. Id. § 1853(c). Upon ensuring that, among other things, a proposed fishing management satisfies federal law, see id. § 1854(a)(1)(A), NMFS executes a final fishery management plan through regulations, id. §§ 1854(b), 1854(a)(1)(B), as it did here for the Amendments.

⁸The Secretary’s appointments to regional councils “must be individuals who, by reason of their occupational or other experience, scientific expertise, or training, are knowledgeable regarding the conservation and management, or the commercial or recreational harvest, of the fishery resources of the geographical area concerned.” 16 U.S.C. § 1852(b)(2)(A). The Caribbean Council is currently composed of 10 members, seven with vote and three with voice but no vote. The present membership of the Caribbean Council is available at http://caribbeanfmc.com/about_us.html.

⁹See also, e.g., Strahan v. Cox, 127 F.3d 155, 171 (1st Cir. 1997) (finding that the “balance of hardships and the public interest tips heavily in favor of protected species”) (citation and quotation marks omitted). But see Animal Welfare Institute v. Martin, 623 F.3d 19, 27 (1st Cir. 2010) (“The Supreme Court has since explained that the drastic result in Hill stemmed from the strong and undisputed showing of irreparable harm that would occur absent an injunction: an entire species would become extinct.”) (citations omitted).

¹⁰The ESA defines critical habitat” as

(i) the specific areas within the geographic area occupied by a species, at the time it is listed . . . on which are found those physical or biological features (I) essential to the

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Section 7, as tersely described by the Ninth Circuit, is “the heart of the ESA . . .” W. Watersheds Project v. Kraayenbrink, 632 F.3d 472, 495 (9th Cir.), cert. denied, 132 S. Ct. 366 (2011); see 16 U.S.C. § 1536(a)(2). Among other things, it prescribes the steps that federal agencies must take to ensure that their actions do not (1) jeopardize endangered or threatened species; or (2) adversely modify their critical habitat. See, e.g., Cal. ex rel. Lockyer v. U.S. Dep’t of Agric., 575 F.3d 999, 1018 (9th Cir. 2009).¹¹ These overlapping yet distinct concepts of jeopardy and adverse modification are later discussed.

Under Section 7, when a federal agency (here the NMFS in its capacity as the Fishery’s operator) plans to take action that may impact a listed species — such as *Acropora* — it must consult with the agency that oversees the species (here, NMFS in its consulting capacity). This process is commonly known as “triggering Section 7 consultation” under the ESA. See § 1536(a)(4).¹² Once the consultation process mandated by Section 7(a)(2) takes place, the consulted agency has to issue a biological opinion “setting forth the Secretary’s opinion, and

conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical areas occupied by the species at the time it is listed . . . upon a determination that such areas are essential for the conservation of the species. 16 U.S.C. § 1532(5)(A).

¹¹ Section 7(a)(2) provides in pertinent part that

[e]ach Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical

¹²As neatly illustrated by Defendants, “NMFS wears two hats”: NMFS’s Office of Sustainable Fisheries is the action agency and NMFS’s Office of Protected Resources is the consulting agency. Docket # 47, p. 5 n. 3; accord Water Keeper Alliance, 271 F.3d at 25. In this sense, NMFS “stands at the intersection” of the Magnuson-Stevens Act and the ESA, insofar as “[i]ts duty is to ensure that action taken by regional councils, including fishery management plans, do not jeopardize the continued existence of a threatened or endangered species or adversely modify critical habit of an endangered species.” Alaska v. Lubchenco, 723 F.3d 1043, 1048 (9th Cir. 2013).

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a summary of the information on which the opinion is based, detailing how the agency action affects the species or its critical habitat.” Id. § 1536(b)(3)(A); see also 50 C.F.R. § 402.14(h).

While Section 7 provides some procedural safeguards, Section 9 requires that the consulting agency determine whether the action complies with another ESA provision, the general prohibition on “tak[ing]” of listed species. 16 U.S.C. § 1538(a)(1)(B). ESA regulations define “take” as “likelihood of injury to [Acropora] by annoying it to such an extent as to significantly disrupt normal behavioral patterns.” 50 C.F.R. § 17.3.

So when, as here, the BiOp determines that the action is not likely to jeopardize the species, but is likely to result in some take, NMFS must, along with the BiOp, issue an incidental take statement (ITS). See 50 C.F.R. § 402.14(I); Water Keeper Alliance, 271 F.3d at 26. An ITS sets the impact of the incidental or indirect take on the listed species, and prescribes terms and conditions aimed at minimizing the impact. See id.; 50 C.F.R. § 402.14(i)(1). It must also suggest “reasonable and prudent alternatives” which can be taken by the federal agency to ensure that its action does not jeopardize the continued existence of the species. 16 U.S.C. § 1536(b)(3)(A). The ITS, furthermore, requires a written statement that “sets forth the terms and conditions (including, but not limited to, reporting requirements) that must be complied with by [NMFS] . . . to implement” the reasonable and prudent measures. Id. § 1536(b)(4)(iv). Here, the ITS and the terms and conditions required are set forth beginning on page 187 of the BiOp. AR 10416.

If this take abides by the ITS’s terms and conditions, it may pass muster under Section 9. See Miccosukee Tribe of Indians of Florida v. United States, 716 F.3d 535, 543 (11th Cir. 2013) (citing 16 U.S.C. § 1536); see also 15 U.S.C. § 1536(o)(2). But if the take is exceeded, the NMFS must reinstate Section 7 consultation to ensure that its “no jeopardy” determination still complies with federal law. 50 C.F.R. §§ 402.14(i)(4), 402.16(a). NMFS would then be obligated to issue a new BiOp — obviously, the court adds, with the latest scientific information at hand.

With the basics of the statutory framework in place, the court turns the precursory-agency actions at issue in this case: The Fishery’s regulation of parrotfish and surgeonfish.

*B. Herbivorous Fish and the Fishery’s Regulatory History*¹³

A starting point is that parrotfish are a cultural component of the U.S. Caribbean diet in some areas, most particularly in St. Croix — but not in Puerto Rico — where the majority of parrotfish harvest takes place. See 76 Fed. Reg. 66,675, 66,677 (Oct. 27, 2011); AR 7728. The Caribbean Council and NMFS began federal management of parrotfish in 1985 under the Fishery Plan. AR 7094. Back then, the Fishery included a mechanism to reduce overfishing— e.g., restrictions on the mesh size of traps — but it lacked size limits, “seasonal closures,” or other such modern management measures that were implemented under later amendments. Id.; see also AR 10315-16 (the Fishery Plan “has never set catch quotas”). In fact, “there were no numerical estimates of the appropriate level of harvest of species . . . until the implementation of the Sustainable Fisheries Act . . . Amendment in 2005.” AR 10315-16. These shortcomings have contributed to the limited quantitative data on parrotfish.¹⁴

Also in 2005, the Caribbean Council ratified Amendment 3 to the Fishery Plan, which determined that parrotfish were undergoing “overfishing.” AR 7095.¹⁵ As noted above, the majority of parrotfish harvesting by far occurs in St. Croix — reported commercial parrotfish landings there increased from around 200,000 pounds in 1998 to over 400,000 in 2006,

¹³Dating back to World War II, AR 10242, the Fishery has an interesting regulatory history. A detailed recount of the Fishery’s evolution, however, falls outside the scope of this opinion, so the court discusses only the facts necessary to set the stage for the analysis.

¹⁴The record shows that “commercial and recreational fishery data available for conducting assessments in the U.S. Caribbean are limited.” AR 10248; see also id. (noting that among “the primary concerns regarding data are the scarce, missing, or unreliable information on fishing effort, spatial/geographic patterns, and life history parameters”). “Although some fishery independent data are available, they are spatially and temporally limited and previous assessments have been unable to incorporate a viable series into the analyses.” Id.

¹⁵A stock experiences “overfishing” when it “is subjected to a level of fishing mortality or annual total catch that jeopardizes” maximum sustainable yield. 50 C.F.R. § 600.310(e)(2)(i)(B), (E).

stabilizing around 356,000 pounds in 2008. AR 10341. Meanwhile, in St. Thomas and St. John parrotfish commercial landings have remained relatively constant since 2000 at around 50,000 pounds. In a stark contrast, such landings have declined significantly in Puerto Rico: From nearly 400,000 pounds in the 1980s to around 60,000 pounds in 2009. Id. Recreational fishers also harvest parrotfish, although data is generally limited in Puerto Rico, being actually unavailable in the USVI. See AR 10344.

As it happens, mankind is less of a threat to surgeonfish than to parrotfish; the former are less desired. St. Croix also reported the highest number of commercial surgeonfish landings, oscillating from 40,000 pounds in 1998 to 35,000 pounds in 1999, and 50,000 pounds in 2006. Id. Commercial landings in St. Thomas and St. John increased from around 30,000 pounds in 2000 to 45,000 pounds by 2004, decreasing to approximately 38,000 pounds in 2008. AR 10341. Highlighting an interesting trend, landings in St. Thomas/St. John, and St. Croix decreased in 2009. AR 9862. So far as concerns surgeonfish, Puerto Rico is again on the other side of the spectrum: Commercial landings of surgeonfish have been virtually zero since the early 1980s. AR 10519.¹⁶ It is therefore no surprise that, contrary to parrotfish, surgeonfish are not listed as undergoing overfishing.

C. Acropora

Apart from being esthetically appealing — corals are vital, living animals. Among their crucial roles are (1) “provid[ing] substrate for colonization by benthic organisms”; (2) “construct[ing] complex protective habits for a myriad of other species including commercial important invertebrates and fishes”; and (3) functioning as “food resources for a variety of

¹⁶While the record shows that recreational fishers also harvest surgeonfish, quantitative recreational landings estimates are unavailable for St. Croix and St. Thomas/St. John. AR 10343; AR 10341. In Puerto Rico, recreational landings of surgeonfish have been intermittent, with no recorded landings between 2000-2009. AR 9722.

animals.” AR 10524.¹⁷ Elkhorn and staghorn are in turn one of the most important species of corals, and their ecological importance cannot be underestimated. See generally Docket # 59.

For starters, Acropora, a species of marine invertebrates are considered “stony corals.” AR 0542. Found most often in shallow tropical waters “throughout the wider Caribbean,” id., they are the only two species of acroporids in that area. AR 10271. Given their large size and branching capabilities, AR 10337, Acropora are two of the major-reef building corals in the wider Caribbean. AR 10271. As such, they serve vital structural and ecological roles that cannot be fulfilled by other reef-building corals. Id. To their flaw, Acropora are environmentally sensitive: They require clear, well-circulated water, being almost entirely dependent on sunlight for nourishment. AR 10272.

As to Acropora populations, the record shows that while both corals still occupy their “historic range,” their populations have experienced precipitous declines in the last three decades. AR 10275. In fact, most populations have shed “80-98% of their 1970s baseline,” partially because of so-called “localized range reductions and expirations.” AR 10275. But studies also show that, from 2001 to 2002, Acropora populations “in a number of locations were considered stable, although these populations were at only 5% of their historical abundance.” AR 10276. The Corals experienced “precipitous declines in the early 1980s throughout their ranges and this decline has generally continued. . . . in the few locations where quantitative data are available” AR 10276; see also id. (“Declines in abundance (cover and colony numbers) are estimated at >97%.”). Still, the record reflects that “both elkhorn and staghorn coral have persisted at extremely reduced abundance levels (in most areas with quantitative data available, less than 3% prior abundance) for at least two decades.” AR 10277.

Populations of Atlantic Acropora have, in many locations, “been reduced to such an extent that the potential for recovery through re-growth of fragments is limited and recovery is

¹⁷See generally Mary Gray Davidson, Protecting Coral Reefs: The Principal National and International Legal Instruments, 26 Harv. Envtl. L. Rev. 499, 502 (2002) (providing an overview of coral reef ecology).

dependent on sexual reproduction.” But since elkhorn and staghorn are “broadcast spawners, once colonies become rare, the distance between colonies may limit fertilization success and there is substantial evidence to suggest that sexual recruitment of both elkhorn and staghorn corals is currently compromised.” AR 10278. “If the species remains at low densities for prolonged periods of time, genetic diversity may be significantly reduced.” AR 10285. Notably, because of “asexual reproduction, the rapid decline (largely from a selective factor), and the lack of rapid recovery that have characterized elkhorn and staghorn coral, it is plausible that these populations have suffered a loss of genetic diversity that could compromise their ability to adapt to future changes in environmental conditions.” AR 10285.

Acropora’s populations declines are attributed to many “stressors” that sometimes “act synergistically.” AR 10279. “Diseases, temperature-induced bleaching, and physical damage from hurricanes,” the record reflects, “are deemed to be the greatest threats to elkhorn and staghorn corals’ survival and recovery.” Id. The record shows that these major threats “are severe, unpredictable, likely to increase in the foreseeable future, and, at current levels of knowledge, unmanageable.” Id.

There are also “moderate” threats to Acropora: (1) “impacts from anthropogenic physical damage (e.g., vessel groundings, anchors, and divers/snorkelers”); (2) “costal development competition”; (3) “predation” (e.g., fishing); (4) “sedimentation”; (5) “nutrients”; (6) “contaminants”; (7) “loss of genetic diversity”; (8) “sea level rise”; and as particularly relevant here, (9) “macroalgae.” AR 10279. Reducing “some of the stressors identified as less severe (e.g., nutrients, sedimentation, macroalgae),” the record shows, “may assist in decreasing the rate of elkhorn and staghorn corals’ decline by enhancing coral condition and decreasing synergistic stress effects.” AR 10279.

Algae growth, of course, affects the coral’s abundance. See 71 Fed. Reg. 26,852, 26,857-58 (May 9, 2006). Their interrelation can be summarized as follows: Algae and Acropora (and corals generally) compete with each other for “space on the reef.” 71 FR 26,852-01, 26,857-58. In order to live, the Corals require “hard, consolidated substrate, including attached, dead coral

skeleton, devoid of turf or fleshly macroalgae for their larvae to settle.” AR 10287. Algae and corals competition boils down to the fact that “less habitat is available for the two species to colonize.” Id.; AR 10337. But because macroalgae has “higher growth rates,” they have “greater competitive ability than elkhorn and staghorn coral.” AR 10284. In plain English, macroalgae are now ruling the Caribbean reefs. See AR 10285.

Add to the above that, “since the 1980s many Caribbean reef areas have undergone a shift in benthic community structure involving reduced cover by stony corals and increased coverage by macroalgae.” AR 10284. Some studies show that this so-called phase-shift “is generally attributed to greater persistence of macroalgae under reduced grazing regimes to human overexploitation of herbivorous fishes, and the regional mass mortality of the long-spined sea urchin in 1983-84.” Id. (citing Hughes 1994). The record, however, also makes clear that coastal development and other “impacts to water quality (principally nutrient input) are also believed to enhance macroalgae productivity.” Id. (citing Acropora BRT 2005). Be that as it may, “macroalgae are now the major space-occupiers on many Caribbean reefs.” AR 10285. In turn, “their dominant occupation of reef surface impedes the recruitment of new corals . . . and hence, recovery by sexual recruits of elkhorn and staghorn coral.” Id.

Diadema, the long-spined urchin, had long been the dominant algae grazer. AR10339; AR 12835. Scientific literature generally posits that the “1983-1984 Caribbean-wide mass mortality of the long-spined urchin (*Diadema*) had severe consequences for many coral reefs.” AR 11340. It is “well-documented” that, following *Diadema*’s mass mortality, there were recorded increases “in macroalgal cover, declines . . . in reef corals, lower recruitment by corals, and greater sediment trapping by filamentous algae” AR 11340; see also AR 128357. No one appears to dispute that *Diadema*’s recovery has been slow, AR 10339, however, the parties — and scientists — appear to dispute the extent of *Diadema*’s effects on *Acropora*. See, e.g., id. On the other hand, it is beyond dispute that in 2005 a “major bleaching event” affected the U.S. Caribbean basin. AR 10277. “This bleaching event led to the direct mortality of some coral

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colonies, while other colonies succumbed to a disease outbreak that attacked the weakened, bleached colonies.” Id.

On May 9, 2006 — at the behest of plaintiff Center for Biological Diversity, see AR 10538, 1541 — NMFS listed elkhorn and staghorn corals as “threatened species” under the ESA. 71 Fed. Reg. 26,852; see also 64 Fed. Reg. 2629, 2629-30 (Jan. 15, 1999). Under the ESA, “[t]he term ‘threatened species’ means any species which is likely to become an ‘endangered species’ within the foreseeable future throughout all or a significant portion of its range.” 16 U.S.C. § 1532(20). An “endangered species,” by contrast, is one that is “in danger of extinction throughout all or a significant portion of its range.” Id. § 1532(6).

NMFS’s decision to uplist *Acropora* was informed by a staff report that incorporated the best scientific and commercial data available. See 71 Fed. Reg. at 26,853. Acknowledging the precipitous decline of *Acropora* over the past three decades, NMFS nevertheless noted that the total number of colonies remains very large and the species persists across a very large geographic range with no evidence of range contractions. Id. And because “both species retain significant potential for persistence,” NMFS ultimately concluded that the species “are not currently at risk of extinction throughout all or a significant portion of their ranges.” Id. However, the report found that the corals’ prognosis for recovery was “quite poor.” AR 10641.

On November 26, 2008, NMFS designated critical habitat for *Acropora*. 73 Fed. Reg. 72,210 (Nov. 26, 2008). As later explained, the ESA requires that, “to the maximum extent prudent and determinable,” an agency must designate a species “critical habitat” at the time of its listing as threatened or endangered. 16 U.S.C. § 1533(a)(3). This designation included four specific areas: the Florida area; the Puerto Rico area; the St. John/St. Thomas area; and the St. Croix area. 73 Fed. Reg. 72,210.

NMFS’ critical habitat designation identified the “key conservation objective” for the Corals as “facilitating increased incidence of successful sexual and asexual reproduction.” Id. The feature essential to the conservation of the species, NMFS concluded, is “substrate of suitable quality and availability, in water depths from the mean high water (MHW) line to 30

m, to support successful larval settlement, recruitment, and reattachment of fragments.” Id. NMFS noted that herbivorous fish “mediate the availability of the essential feature” and that an observed shift in benthic community structure from the dominance of stony corals to fleshy algae on Caribbean coral reefs is attributed, in part, “to the greater persistence of fleshy macroalgae under reduced grazing regimes due to human overexploitation of herbivorous fishes.” Id. at 72,213. As indicated, however, NMFS also observed that the regional mass mortality of *Diadema* was another factor that has contributed to algae growth on Caribbean reefs. Id.

D. The Magnuson-Stevens Reauthorization Act

The Reauthorization Act took effect in 2007, see 2007 U.S.C.C.A.N. S83 (Jan. 12, 2007), and, as relevant here, imposed more rigorous conservation mandates for all fishery management plans. It required the Fishery Plan to “establish a mechanism for specifying annual catch limits [ACLs] in the plan . . . , implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability [AMs].” 16 U.S.C. § 1853(a)(15). To that effect, NMFS required councils to propose AMs that are related to the overall annual catch limits in a fishery that must be specified for each stock in a fishery. See 50 C.F.R. § 600.310(g)(1)-(3).

1. Parrotfish, Surgeonfish, and the Amendments

Complying with requirements of the Reauthorization Act to set ACLs and AMs for the commercial and recreational harvest of species that are undergoing overfishing (e.g., parrotfish), the Caribbean Council developed the so-called 2010 Amendments to the Fishery Plan. This process, as related, resulted in Amendment 5 to the Fishery Plan. AR 7042. Similarly, because the Reauthorization Act required the Council to specify ACLs and AMs for species that are not undergoing overfishing (e.g., surgeonfish), the Caribbean Council developed the so-called 2011 Amendments to the Fishery Plan. This process resulted in Amendment 6 to the Fishery Plan. AR 9676.

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Amendment 5 established, among other things, ACLs for parrotfish taken from Puerto Rico, St. Thomas/St. John, and St. Croix. It specifically set a commercial ACL of 350,500 pounds of parrotfish in the U.S. Caribbean, including 240,000 pounds for St. Croix, and 42,500 pounds for St. Thomas/St. John. For Puerto Rico, it established a commercial ACL of 52,737 pounds and a recreational ACL of 15,263 pounds. AR 7141. These ACLs for parrotfish are based on a 15% reduction to average annual commercial parrotfish landings during the period of 1999-2005 for Puerto Rico and the period of 2000-2005 for St. Thomas/St. John. This constitutes a greater than 20% reduction to average annual commercial parrotfish landings during the period of 1999-2005 for St. Croix. AR 7141, 7157. For St. Croix, the ACL adjusts harvest to a level roughly 33% below the average of the most recent two years of landings data available at the time. AR 8744.

Amendment 6 followed suit and established ACLs for surgeonfish taken from Puerto Rico, St. Thomas/St. John, and St. Croix.¹⁸ For the USVI, these measures represented a 25% reduction in average annual commercial landings over the selected period of years (1999-2009 for St. Croix and 2000-2009 for St. Thomas/St. John). AR 9735, 9742-43, 9745. For Puerto Rico, this was a 25% reduction in the highest year of recreational landings multiplied by three. AR 9742-43.

The Amendments also include AMs that reduce the length of the fishing season for the affected species group in case an ACL is exceeded. AR 7161, 7164.¹⁹ Last, but certainly not

¹⁸Amendment 6 prescribed a commercial ACL of 73,620 pounds in the U.S. Caribbean, including 10,768 pounds for the commercial and recreational sector of Puerto Rico; 29,249 pounds for St. Thomas/St. John; and 33,603 pounds for St. Croix. AR 9751. These ACLs were determined based on a 25% reduction in the so-called "Acceptable Biological Catch" for surgeonfish. AR 9738-9747.10222. Furthermore, the Amendments establish a "2 fish per person/6 fish per vessel bag limit" for the recreational harvest of parrotfish, AR 10344, and an aggregate bag limit of five fish per person per day for the recreational harvest of surgeonfish including no more than one surgeonfish per person per day allowed within the aggregate. AR

¹⁹NMFS published a final rule to implement Amendment 6 on December 30, 2011. 76 Fed. Reg. 82,414; AR 10222.

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least, Amendment 5 includes a prohibition on the harvest of the three largest species of parrotfish that inhabit Caribbean coral reefs, namely “blue, midnight, and rainbow parrotfish.” AR 8743.²⁰ This prohibition is crucial because, as later explained, large parrotfish are more efficient algae grazer, so they benefit *Acropora* the most.

E. The Challenged Agency Actions: The 2011 BiOp

Because the Amendments impacted the harvest of parrotfish and surgeonfish, and because these herbivorous fish indirectly affect *Acropora* and their critical habitat, a Section 7 consultation was triggered, which culminated in the BiOp. AR 10230.

At the outset the BiOp acknowledged that “much of the literature available on the relationships between . . . herbivores and corals and coral reef ecosystem is recent — from the late 1990s through 2010 — when acroporids had already become very rare on Caribbean reefs” AR 10337. And because “the majority of papers do not evaluate elkhorn and staghorn corals explicitly,” NMFS decided to apply “the findings for corals, generally.” *Id.* Similarly, NMFS conceded in the BiOp, “[n]o stock assessments have been conducted for parrotfish or surgeonfish in the U.S. Caribbean.” AR 10343. As such, “existing data are insufficient to quantify current, historical, and unfished biomass levels in the US Caribbean or to accurately describe how populations would respond to changes in removals [of herbivorous fish].” AR 10343. Notwithstanding the lack of such detailed, quantitative data, the BiOp clarifies that it considered potential effects on *Acropora* in view of the best available information concerning the commercial and recreational fisheries for parrotfish and surgeonfish, including reported landings data for Puerto Rico, St. Thomas/St. John, and St. Croix.²¹

²⁰See 50 C.F.R. § 622.434(c) (“No person may fish for or possess midnight parrotfish, blue parrotfish, or rainbow parrotfish in or from the Caribbean EEZ. Such fish caught in the Caribbean EEZ must be released with a minimum of harm.”)

²¹AR 10343; AR 11677 (Friedlander and Beets 2008); AR 11737 (Garcia-Sais et al. 2008); AR 13134 (Pittman et al. 2008); AR 13490 (Rothenberger et al. 2008).

The BiOp made qualitative observations regarding the effects of herbivorous fish harvest on staghorn and elkhorn habitat. The following excerpt best summarizes one of the BiOp's main findings:

if herbivorous fish harvest was the primary cause of the observed phase-shifting (from coral dominated to algae dominated reefs) in the three critical habitat units in the U.S. Caribbean, one would expect the St. Croix unit to show the greatest rate of phase-shift, indicated by significantly more algal cover, when compared to the Puerto Rico and St. Thomas/St. John units, based on the current harvest levels and the size of the platforms being fished. The information in this section indicates that the phase-shift is just as severe in all three critical habitat units. This suggests that although harvest of herbivorous fish may be indirectly adversely affecting the essential feature, it is most likely not the driver of the phase-shift, but just one component of a larger function.

AR 10354. Rather, NMFS concluded, "diseases, temperature-induced bleaching, and physical damage from hurricanes are likely the greatest threats to elkhorn and staghorn corals survival and recovery." Id. To be clear, the BiOp acknowledged that continued harvests of parrotfish and surgeonfish adversely affects staghorn and elkhorn coral and their critical habitat.

Nonetheless, it concluded that the ACLs, the prohibition on harvesting the three large-bodied parrotfish, and the other management measures implemented under the Amendments should result in population increases of herbivorous fish. AR 10355. While "we believe the proposed lower harvest levels will lead to a readily observable increase in herbivorous fish biomass," NMFS nevertheless conceded that — because of the same lack of data — it could not "estimate the likely extent of that increase." AR 10418. The BiOp then predicted that population increases of herbivorous fish will, in turn, result in "greater amounts of grazing under the proposed action than there were at the time of [critical habitat] designation, when parrotfish and surgeonfish harvests were unrestricted." AR 10355. Accordingly, NMFS reasoned that, although the proposed action will continue to adversely affect the Coral's critical habitat, "those adverse affects are likely to be reduced by some amount that is currently unquantifiable." Id.

Relying on the foregoing observations regarding the potential effects of harvesting herbivorous fish, NMFS concluded that the Amendments are “not likely to jeopardize the continued existence” of Acropora. AR 10415. Nor is the proposed action “likely to destroy or adversely modify” designated Acropora critical habitat in the U.S. Caribbean. Id.

As to the ITS, the BiOp concluded that, because data on number and biomass of herbivorous fish do not currently exist, “it is impractical to try and estimate what changes in these metrics represent a decline over time” for purposes of establishing a trigger for potentially reinitiating Section 7 consultation. AR 10418. So NMFS instead instituted a framework for estimating changes in herbivorous fish populations over time based on monitoring, and established terms and conditions mandating that an assessment of herbivorous fish biomass be conducted within one year of the BiOp’s completion. Id. NMFS also explained that it will monitor the biomass of herbivorous fish during three-year periods to make certain that its prediction and assumptions are correct — that is to ensure that it is not decreasing. Id. at 10418-19. If herbivorous fish biomass decreases, reinitiation of ESA consultation would be triggered to assess possible adverse effects on the Corals. Id. at 10419.

Standard of Review

Judicial review of this ESA action is governed by the APA, e.g., Strahan v. Linnon, 187 F.3d 623, at * 2 (1st Cir. 1998) (per curiam) (unpublished), which mandates that review of agency decisions “must proceed on the administrative record.” Atieh v. Riordan, 727 F.3d 73 (1st Cir. 2013). Being the BiOp a final agency action, e.g., Bennett v. Spear, 520 U.S. 154, 177-78 (1997), it is subject to review under the APA. 5 U.S.C. §§ 704, 706(2)(A). NMFS’s ongoing authorization of the Fishery pursuant to the BiOp is also reviewable under the ESA. 16 U.S.C. § 1540(g).

A court may set aside an agency action only when the administrative record shows that the agency decision is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706(2)(A); Massachusetts v. U.S. Nuclear Regulatory Comm’n, 708 F.3d 63, 73 (1st Cir. 2013). “An agency decision fails to pass this test if the

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administrative record reveals that “the agency relied on improper factors, failed to consider pertinent aspects of the problem, offered a rationale contradicting the evidence before it, or reached a conclusion so implausible that it cannot be attributed to a difference of opinion or the application of agency expertise.” Atieh, 727 F.3d at 73 (quoting Assoc’d Fisheries of Me., Inc. v. Daley, 127 F.3d 104, 109 (1st Cir.1997)). In the summary-judgment context, “the real question is . . . whether the administrative record, now closed, reflects a sufficient dispute concerning the factual predicate on which [the agency] relied . . . to support a finding that the agency acted arbitrarily or capriciously.” Mass. Dep’t of Pub. Welfare v. Sec’y of Agric., 984 F.2d 514, 525 (1st Cir. 1993).

“Because the APA standard affords great deference to agency decisionmaking and because the Secretary’s action is presumed valid, judicial review, even at the summary judgment stage, is narrow.” Lovgren, 701 F.3d at 20-21 (quoting Assoc’d Fisheries of Me., 127 F.3d at 107). These principles retain considerable bite where, as here, the action impugned falls within the agency’s technical and scientific expertise. See, e.g., Marsh v. Oregon Natural Res. Council, 490 U.S. 360, 377-78 (1989). Barring, of course, violation of federal law, policy choices are the agency’s providence, so “even if a reviewing court disagrees with the agency’s conclusions, it cannot substitute its judgment for that of the agency.” Assoc’d Fisheries of Me., 127 F.3d 104 at 109.

That is not to say, the First Circuit has clarified, that this “highly deferential standard” is a “rubber stamp.” Airport Impact Relief, Inc. v. Wykle, 192 F.3d 197, 203 (1st Cir. 1999). “The reviewing court must undertake a thorough, probing, in-depth review and a searching and careful inquiry into the record.” Id. (citation and internal quotation marks omitted). Only by scrutinizing the record can courts “ensure that agency decisions are founded on a reasoned evaluation of the relevant factors.” Id.

Applicable Law and Analysis

While Plaintiffs launch general and specific legal challenges at the BiOp’s determinations, their core challenge is two-fold. On the one hand, they assail the BiOp’s

conclusion that continued fishing of herbivorous fish, subject to the new management measures imposed by the Amendments, is unlikely to jeopardize the Corals' continued existence. See Docket # 44, p. 12. On the other hand, Plaintiffs challenge the determination that such continued fishing is not likely to destroy or adversely modify designed Acropora critical habitat in the U.S. Caribbean. Id. While these are two distinct concepts (and are applied as such), insofar as the parties' briefs discuss both aspects jointly, the court will generally follow this approach for ease of analysis.

Two other preliminary findings are in order. Context is important. And this is particularly true here, where given the "suite of stringent protections for depleted fisheries" introduced by the Reauthorization Act, Lovgren, 701 F.3d at 12, it simply cannot be said that the Amendments are aimed at anything but reducing authorized harvests of herbivorous fish in relation to historical harvests. Indeed, the record shows (and Plaintiffs do not dispute) that continued fishing, subject to the ACLs and AMs established under the Amendments, should result in a decrease in fishing of herbivorous fish relative to the status quo. Compare AR 10341 (historic commercial fishery landings data) with AR 10344 (commercial and recreational harvest levels under Amendments 5 and 6). If successful, logic dictates that the Amendments should increase populations of parrotfish and surgeonfish.

Because Plaintiffs do not allege any violations of the Magnuson-Stevens Act here, however, they are precluded from collaterally impugning the above findings and estimates (e.g., that the Amendments will prevent overfishing) reached by NMFS during the Fishery Plan's amendment process. Cf. Turtle Island Restoration Network v. U.S. Dep't of Commerce, 351 F. Supp. 2d 1048, 1053 (D. Haw. 2005), aff'd, 438 F.3d 937 (9th Cir. 2006). So Plaintiffs "[m]ust be bound by the consequences of . . . [their] litigation strategy." Trans-Spec Truck Service, Inc. v. Caterpillar Inc., 524 F.3d 315, 327 (1st Cir.), cert. denied, 555 U.S. 995 (2008) (citation omitted). The heart of this case, then, is whether the effects of continued fishing under the Amendments — whose conclusions on reducing overfishing must be presumed correct —

jeopardize Acropora and therefore violate the ESA. This threshold determination must guide the ensuing analysis.

On another note, this is surely a paradigm case for judicial deference to NMFS's scientific determinations. The high level of deference owed to NMFS here is particularly strong, because the agency had to predict a myriad of future ecological and regulatory conditions, all while estimating the likelihood, extent, and duration of injury to Acropora. See, e.g., Balt. Gas & Elec. Co. v. Natural Res. Def. Council, 462 U.S. 87, 103 (1983) (finding that when an agency "is making predictions, within its area of special expertise, at the frontiers of science . . . as opposed to simple findings of fact, a reviewing court must generally be at its most deferential"). For instance, the BiOp noted that because "there is little convincing evidence to suggest that algae can act as a direct cause of coral mortality," AR 10405, "it is currently unclear whether the indirect effects from the reduction of macroalgae mediation by herbivorous fish is directly reducing the areal coverage (numbers) of elkhorn and staghorn coral." Id.; see also 10408 (noting that the "impact of disease[s], though clearly severe, is poorly understood in terms of etiology and possible links to anthropogenic stressors").

Keeping the foregoing in mind, the court turns to Plaintiffs' first and second assignments of error, to wit: whether the BiOp (1) correctly based its "no jeopardy" and "no adverse modification" determinations on the best available science and established a rational connection between the facts found and the conclusions made; and (2) "properly considered the Fishery's cumulative adverse impacts in the context of severe existing threats to the species and their habitat." Docket # 44, p. 2. In their summary-judgment brief, Plaintiffs often discuss both of

these theories together.²² For ease of analysis, and absent the necessary clarification, the court emulates this approach.

II.

A. Defendants Correctly Based Their “No Jeopardy” and “No Adverse Modification” Determinations on the Best Available Science and Established a Rational Connection between the Facts Found and the Conclusions Made

B. The BiOp Properly Considered the Fishery’s Cumulative Adverse Impacts in the Context of Severe Existing Threats to the Species and Their Habitat

As said, the BiOp considered the effects of continued commercial and recreational fishing on herbivory by parrotfish and surgeonfish. In doing so, it considered the impact and importance of herbivorous fish on the decline or recovery of Acropora. See, e.g., AR 10354. NMFS conceded at the outset that because herbivorous fish graze on macroalgae that occupy coral reefs, continued fishing of these species will adversely affect Acropora and their critical habitat when compared to unfished conditions. AR 10355, 10358. Nonetheless, it determined that continued fishing under the Amendments — subject to the ACLs/AMs, and the prohibition of harvest of the three large-bodied parrotfish, among other measures — is expected to result in population increases of herbivorous fish relative to the status quo. AR 10354. Such an increase, NMFS anticipates, will result in a greater grazing than when harvest of parrotfish and surgeonfish was “unrestricted.” AR 10355.²³ Now, no one disputes whether NMFS has to avoid

²² For example, in their second assignment of error Plaintiffs argue, among other things, that the ESA “prohibits NMFS from comparing the threats from a proposed action rather than adding them to the species or habitat’s baseline condition.” Docket # 44, p. 15. This is the same argument that Plaintiffs make in their third assigned error. Compare id. with id., p. 20 (faulting NMFS for “merely compar[ing] the current action with other existing threats, resulting in an analysis that assessed the comparative rather than the additive effect of removing parrotfish on the staghorn and elkhorn corals and their critical habitat”).

²³ See also AR 10356 (“Since there are predicted to be greater amounts of grazing under the proposed action than there were at the time of designation, when parrotfish and surgeonfish harvests were unrestricted, the proposed action would be expected to reduce the previously occurring level of adverse effects to critical habitat from herbivorous fish harvest.”).

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any adverse effects on listed species before proceeding with an action. Docket # 47, p. 13; Docket # 53, p. 1. The answer to that is obviously no. All agree instead that ESA's Section 7(a)(2) mandates only that NMFS ensure that its actions are not likely to jeopardize the existence of a listed species or adversely modify their designated critical habitat. See 16 U.S.C. § 1536(a)(2).

“Jeopardize the continued existence of means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.” 50 C.F.R. § 402.02. In the normative Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv. (hereinafter “National Wildlife”), the Ninth Circuit held that because jeopardize means to “‘expose to loss or ‘injury’ or to ‘imperil,’ and because “‘either of these implies causation, . . . [there must be] some new risk of harm.” 524 F.3d 917, 930 (9th Cir. 2008) (emphasis added). Thus, “agency action can only ‘jeopardize’ a species’ existence if that agency action causes some deterioration in the species’ pre-action condition.” Id.

In a seemingly related (but distinct) vein, destruction or adverse modification is defined as “a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. . . .” 50 C.F.R. § 402.02; see Conservation Cong. v. U.S. Forest Serv., 720 F.3d 1048, 1057 (9th Cir. 2013). The ESA defines “critical habitat” for a threatened or endangered species as areas that are “essential to” or “essential for” the species’ conservation. 16 U.S.C. §§ 1532(5)(A)(i), (ii). Examples of such “alterations” are the ones that “adversely modify[] any of those physical or biological features that were the basis for determining the habitat to be critical.” Id. Here, NMFS’s critical habitat designation identified the “key conservation objective” for the Corals as “facilitating increased incidence of successful sexual and asexual reproduction.” 73 Fed. Reg. 72,210 (Nov. 26, 2008).²⁴ As

²⁴As indicated, NMFS concluded that the feature essential to the conservation of the species (also known as essential feature) supporting the identified conservation objective is “substrate of suitable quality and availability, in water depths from the mean high water (MHW) line to 30 m, to

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noted, designated Acropora critical habitat includes four specific areas: the Florida area; the Puerto Rico area; the St. John/St. Thomas area; and the St. Croix area. 73 Fed. Reg. 72,210. The Fishery does not affect the Florida area, so it is not at play in this case.

These threshold-like determinations are particularly important here, where Defendants (and the BiOp) concede that because parrotfish and surgeonfish graze on macroalgae that occupies coral reefs, their continued fishing is a “stressor” that adversely affects Acropora and their critical habitat. See, e.g., Docket # 53, p. 2; AR 10355 & 10358. But, as said, that a factor is a “stressor” cannot be, without more, dispositive of an ESA analysis. Of course, the extent and significance of such factors should be used as a prism to shed light upon the analysis.

As discussed in detail below, Defendants used the best available scientific information to conclude that fishing of herbivorous fish is not a “major stressor” of Acropora. For example, the BiOp stressed that the ongoing phase-shift to high macroalgal cover and low coral cover is similarly severe in St. Croix, which has the smallest shelf area and where significant herbivorous fish harvest occurs, as in Puerto Rico which has the smallest shelf area and where less herbivorous fish harvest occurs on larger shelf areas. AR 10349, 10354. It noted, furthermore, that most species of parrotfish do not consume established macroalgae but rather consume new, filamentous algal growth. AR 10339 — hence, irrespective of parrotfish grazing, “the density of existing, more established algae may increase.” AR 10340. So, in short, “regardless of the overall structure and diversity of herbivorous fish stocks, it has been suggested that there may be a threshold to the amount of macroalgae an herbivorous fish guild can graze before the macroalgae growth will outpace the population’s ability to keep grow in check.” AR 10339 (citing Williams et al. 2001; Carpenter 1990b).

Critically, the BiOp noted that there is no conclusive evidence that even a complete prohibition on fishing would be sufficient to “mediate algal growth” or “decrease algal cover.” AR 10354; see also AR 10357-58. White band disease outbreaks, hurricanes, and

support successful larval settlement, recruitment, and reattachment of fragments.” Id.

temperature-induced bleaching, were instead deemed by the BiOp as the “major threats” to the Corals. AR 10275, 10354. Against this factual drop, NMFS reasonably concluded that implementing the Amendments will alleviate the adverse effects resulting from continued fishing. See AR 10358 (“Under the proposed action we anticipate rates of herbivory will increase, relative to those occurring currently.”). For these and other reasons, the BiOp’s conclusions — that implementation of the Amendments is not likely to jeopardize the continued existence of Acropora coral or adversely modify their critical habitat — were neither arbitrary nor capricious. The record supports these reasonable determinations.

Plaintiffs resist these conclusions, arguing that they bear no rational connection with the record. See generally Docket # 44, p. 15. Calling them “untenable,” Plaintiffs vehemently dispute NMFS’s conclusions that the level of fishing it authorizes is not likely to jeopardize the already perilously scarce staghorn and elkhorn corals or destroy or adversely modify their already severely degraded habitat.” Id., p. 15. They offer several arguments on this front, and the court considers them seriatim.

1. “Best available evidence” requirement

As said, Plaintiffs argue that, in promulgating the BiOp, NMFS ignored the requirement that agencies use the best scientific and commercial data available. Docket # 44, p. 9. The court is unpersuaded.

The ESA requires NMFS to “use the best scientific and commercial data available” in rendering its biological opinion. 16 U.S.C. § 1533(b)(1)(A). The Supreme Court has said that the “obvious purpose of the requirement that each agency ‘use the best scientific and commercial data available’ is to ensure that the ESA not be implemented haphazardly, on the basis of speculation or surmise.” Bennett, 520 U.S. at 176. And courts have interpret this requirement as “merely prohibit[ing] agencies from disregarding available scientific evidence that is in some way better than” the one relied on to formulate the BiOp. See, e.g., Kern Cnty. Farm Bureau v. Allen, 450 F.3d 1072, 1080 (9th Cir. 2006); City of Las Vegas v. Lujan, 891 F.2d 927, 933 (D.C.Cir. 1989). In other words, NMFS “cannot ignore available biological

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information.” Kern Cnty. Farm Bureau, 450 F.3d at 1080-81 (quoting Conner v. Burford, 848 F.2d 1441, 1454 (9th Cir.1988)).

In determining whether the BiOp used the “best available” scientific information, substantial deference is accorded to the NMFS’s assessment of the quality of what is available. See, e.g., Miccosukee Tribe of Indians of Florida v. United States, 566 F.3d 1257, 1265 (11th Cir. 2009). That helps explain why NMFS does not have to conduct independent studies or await new data. See Heartwood, Inc. v. U.S. Forest Serv., 380 F.3d 428, 436 (8th Cir. 2004) (finding that this requirement “does not require an agency to conduct new studies when evidence is available upon which a determination can be made. . . . All that is required of the agencies is to seek out and consider all existing scientific evidence relevant to the decision at hand”) (citation omitted); Ecology Ctr., Inc. v. U.S. Forest Serv., 451 F.3d 1183, 1194 (10th Cir. 2006) (same). Moreover, even “assuming the studies the [agency] relied on were imperfect, that alone is insufficient to undermine those authorities’ status as the ‘best scientific . . . data available [T]he [agency] must utilize the ‘best scientific . . . data available,’ not the best scientific data possible.” Building Indus. Ass’n of Superior Cal. v. Norton, 247 F.3d 1241, 1246 (D.C.Cir. 2001) (citation omitted).

When viewed through this prism, Plaintiffs’ challenges on this front fall short of the mark. Plaintiffs complain about NMFS’s scientific determination that the Amendments will increase the overall biomass of herbivorous fish and mitigate increasing algal cover. See Docket # 44, p. 16 (citing AR 10349, 1351, 101404). But instead of specifically pointing the court, contra Native Vill. of Chickaloon v. Nat’l Marine Fisheries Serv., --- F.Supp.2d ----, 2013 WL 2319341, at * 24 (D. Alaska May 28, 2013) (“Plaintiffs claim that the 160 decibel threshold is scientifically outdated and contrary to the opinion of five leading bioacousticians”), to any better evidence ignored or “omitted,” Norton, 247 F.3d at 1246, by the BiOp, they rely heavily on the fact that “a NMFS scientist involved in drafting the BiOp concluded that the proposed action presented ‘a slum-dunk DAM [destruction or adverse modification of critical habitat]’ and stated that ‘in order to err on the side of the species (as required), we should call

DAM/Jeopardy” Docket # 44, p. 9 (quoting AR 25386). Plaintiffs’ reliance on such comments is misplaced. These criticisms, which were issued during the Section 7 consultation process, come nowhere close to defeating the presumption that NMFS’s final product (the BiOp) considered the best scientific and commercial data available. As later explained, these disagreements merely speak to the inferences drawn from the evidence — not to the quality of the evidence per se. Cf. Aluminum Co. v. Bonneville Power Admin., 175 F.3d 1156, 1162 (9th Cir. 1999) (holding that biological opinion was not arbitrary and capricious where differing scientific views were resolved through expert choices).

This determination is bolstered by the Supreme Court’s clarification that an agency’s compliance with the ESA must be reviewed based on the agency’s final action, and not the views expressed by individual staff at earlier stages of the administrative process. Nat’l Ass’n of Home Builders v. Defenders of Wildlife, 551 U.S. 644, 658-59 (2007). “[T]he fact that a preliminary determination by a local agency representative is later overruled at a higher level within the agency does not render the decisionmaking process arbitrary and capricious.” Id. at 659; accord Fund for Animals v. Norton, 365 F. Supp. 2d 394, 418 (S.D.N.Y. 2005) (observing that “vigorous and thoughtful debate . . . does not equate to a lack of substantial evidence . . .”), aff’d, 538 F.3d 124 (2nd Cir. 2008); Nat’l Wildlife Fed’n v. Norton, 306 F. Supp. 2d 920, 929 n.15 (E.D. Cal. 2004) (finding that “mere existence of internal disagreements between agency experts does not make the agency’s decision arbitrary or capricious”) (citation omitted).

As properly pointed out by Defendants, moreover, the e-mails and other communications in the record simply show that the BiOp was developed from a vigorous (and sometimes heated, as Plaintiffs aptly emphasize) debate. But debates — particularly in the recently evolving science at play here — are a good thing. Human experience dictates that debates invite scrutiny. This goes hand in hand with ESA’s requirement that agency decisionmaking be scrutinized to insure that listed species are being properly protected. See, e.g., Town of Superior v. U.S. Fish & Wildlife Serv., 913 F. Supp. 2d 1087, 1141 (D. Colo. 2012). Therefore, because NMFS’s analysis concerning the relative effects of the Amendments evolved and changed prior to

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reaching final decision, see Nat'l Ass'n of Home Builders, 551 U.S. at 658-59, the BiOp is entitled to deference.

True enough, as Plaintiffs repeatedly point out, see e.g., Docket # 44, p. 17 (and Defendants acknowledge), there are areas of scientific uncertainty in view of the dearth of data on (1) reef fish harvests, AR 10423; (2) relative threats to Acropora; and (3) the magnitude and timing of any grazing-induced changes in algal cover caused by the Amendments. But such sparseness of information does nothing to rebut the presumption that NMFS's BiOp complied with the "best available data" requirement in § 1533(b)(1)(A). Again, this requirement means "not only that data be attainable, but that researchers in fact have conducted the tests." Am. Wildlands v. Kempthorne, 530 F.3d 991, 998 (D.C. Cir. 2008) (emphasis added). And here, the record shows (and Plaintiffs do not dispute) that many tests and studies simply did not exist. See, e.g., AR 10476 (recognizing "paucity of data on herbivorous populations," but clarifying that "these data are the best available from which to try and determine the effects of the action") (emphasis added). On the other hand, the record not only makes manifest that the BiOp cited a plethora of scientific studies, see AR 10425-10460, but it also shows that NMFS dedicated many pages of in-depth discussion and analysis on the inferences drawn from such scientific literature. See, e.g., AR 10346-58, 10400-09. That NMFS's BiOp ultimately disagreed with some of the studies favorable to Plaintiffs' position is a far cry from saying that such studies were not "used," Docket # 51, p. 8 — as incorrectly argued by Plaintiffs in their opposition after "clarifying" that NMFS did not "ignore" anything. NMFS, for instance, considered scientific literature stating "that only unfished stocks of herbivores can achieve the maximum mitigative effect." AR 10354 (citing studies). NMFS's ultimate determinations simply evince judgment calls: The BiOp ascribed less weight to such studies than Plaintiffs purportedly do.

Be that as it may, the NMFS was entitled to do this. Indeed, this sort of technical and scientific choice falls squarely within NMFS's domain. See, e.g., Strahan, 187 F.3d 623, at * 3 ("[A] reviewing court cannot substitute its own scientific judgment in place of the agency's judgment."). And "an agency's decision may be based on the best scientific evidence available

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even if the administrative record contains evidence for and against its decision.” Trout Unlimited v. Lohn, 559 F.3d 946, 958 (9th Cir. 2009); accord, e.g., Maine v. Norton, 257 F. Supp. 2d 357, 389 (D. Me. 2003) (noting that “even where there are competing expert opinions, or where the scientific data are equivocal, it is the agency’s prerogative to weigh those opinions and make a policy judgment based on the scientific data”) (citation and internal quotation marks omitted); Blue Water Fishermen’s Ass’n v. Nat’l Marine Fisheries Serv., 226 F. Supp. 2d 330, 339 (D. Mass. 2002) (“[I]n reviewing and rejecting Dr. Wang’s position, the NMFS did not ignore the best available data. Rather, it considered and disagreed with Dr. Wang’s interpretation of the data.”). Whether or not NMFS’s choices and inferences were rationally justified by the record is another matter, and it is discussed next.

To be sure, the lack of data and studies does not, as correctly argued by Defendants, preclude NMFS from implementing the Amendments and concluding that these actions are not likely to jeopardize Acropora or adversely modify their critical habitat. “It is well settled . . . that the Secretary can act when the available science is incomplete or imperfect, even where concerns have been raised about the accuracy of the methods or models employed.” North Carolina Fisheries Ass’n, Inc. v. Gutierrez, 518 F.Supp.2d 62, 85 (D.D.C.2007) ; see also, e.g., Greenpeace Action v. Franklin, 14 F.3d 1324, 1336 (9th Cir.1992) (finding that “when an agency relies on the analysis and opinion of experts and employs the best evidence available, the fact that the evidence is ‘weak,’ and thus not dispositive, does not render the agency’s determination ‘arbitrary and capricious.’”). That is so because, as concluded above, in assessing the effects of the Amendments, the BiOp indeed considered the best available scientific data — including, but not limited to, a qualitative analysis using parameters like “macroalgal/coral percent cover, changes in . . . [such parameters] over time, and trends in herbivorous fish biomass overtime” AR 10343; see also AR 10476.

In all events, because Plaintiffs’ have identified no other “better” scientific information that NMFS ignored, their challenge falters. E.g., Norton, 247 F.3d 1241, 1246-47 (rejecting

claims under ESA best available data standard where challenger failed to point to any superior data that was ignored by expert agency).

Because the record shows that NMFS weighed and utilized the best scientific and commercial data available in rendering its findings regarding the effects of the Amendments on parrotfish and surgeonfish and with respect the predicted effects on elkhorn and staghorn corals, and because Plaintiffs fall short of rebutting the presumption of correctness to which such agency findings are entitled to under the APA, that assigned error is rejected.

2. Rational Nexus Between the Evidence and the Conclusions Made

Next, Plaintiffs question several of the scientific inferences underlying the BiOp. The court address them seriatim.

It is convenient to make clear at the outset that the courts's role is not to determine whether the findings in the BiOp "require a jeopardy conclusion." Wild Fish Conservancy v. Salazar, 628 F.3d 513, 527 (9th Cir. 2010) (hereinafter Wild Fish Conservancy). Rather, it is well settled that the ESA simply requires the NMFS to consider the "effects of the action" and "articulate[] a rational connection between the facts found and the conclusions made." Pac. Coast Fed'n of Fishermen's Associations v. U.S. Bureau of Reclamation, 426 F.3d 1082, 1090 (9th Cir. 2005). So the BiOp must reasonably explain "how the agency action affects the species or its critical habitat," including a general assessment of whether the action would lead to jeopardy or adverse modification. 16 U.S.C. § 1536(b)(3)(A).

Plaintiffs' challenge on some of the scientific inferences underlying the BiOp is primarily supported by dissident opinions, to wit critical comments by a staff biologist in the NMFS Southeast Regional Office. See Docket # 44, p. 19. This NMFS biologist, for example, commented that "the assumption that the proposed reductions are sufficient to end over fishing of a stock that has been identified as under going overfishing is based on nothing." AR 26243; see also AR 27871 (dismissing as "outrageous" the conclusion that reducing the harvest level would lead to improved fish stocks). Again, the court find that Plaintiffs' reliance on such comments is mislaid.

As Defendants correctly rebut (and Plaintiffs do not respond), the questions raised by the staff biologist “go to issues not involving the ESA and the biologists’s area of expertise, but rather to issues under the Magnuson-Stevens Act.” Docket # 47, p. 20. Indeed, as Defendants persuasively note, even “a supervising officer observed that it was not within the expertise of that biologist to opine on the fishery management implications of the proposed ACLs.” *Id.* n. 6 (citing AR 26249). But as concluded above, given Plaintiffs’ litigation strategy (they bring no claims under the Magnuson-Stevens Act), they are precluded from questioning these estimates and conclusions.

It is true, as Plaintiffs further point out, that another staff biologist questioned whether there could be any fishing on herbivorous fish without compromising the natural densities and diversities of those populations and thereby impairing their ability to mediate algal growth. *See* Supp.AR 28123, 28136. But as concluded above, *see* above pages 27-29, this dissent was reflected — and thus considered — in the BiOp, which explicitly recognized that “some [studies] state that only unfished stocks of herbivores can achieve the maximum mitigative effect. . . .” AR 10353.²⁵ The BiOp, however, demurred that the phase shifting (from coral-dominated to algae-dominated reef systems) is similarly severe in St. Croix — where most harvest of parrotfish occurs — than in Puerto Rico and St. Thomas/St. John. AR 10354. In other words, NMFS pointed out, there is no conclusive proof that even a total prohibition on fishing would suffice to “mediate algal growth” or “decrease algal cover.” *Id.* Under these circumstances, the court must defer to the NMFS’s decisionmaking. “The rationale for deference is particularly strong when the [agency] is evaluating scientific data within its technical expertise. [I]n an area characterized by scientific and technological uncertainty[,] . . . this court must proceed with particular caution, avoiding all temptation to direct the agency in a choice between rational alternatives.” *Int’l Fabricare Inst. v. EPA*, 972 F.2d 384, 389

²⁵ *See also* AR 10353 (“Many studies indicate [that] a numerically abundant, high biomass, intact size structure and diverse herbivorous fish population would likely achieve the highest herbivory rates.”).

(D.C.Cir.1992) (citation and internal quotation marks omitted); see also In re Polar Bear Endangered Species Act Listing & Section 4(d) Rule Litigation, 709 F.3d 1,9 (D.C.Cir. 2013).²⁶

In short, NMFS's decision "amount[s] to nothing more than competing views about policy and science, on which . . . [courts] defer to the agency." Id. (citation and internal quotation marks omitted).

The upshot is that, armed with such empirical information, NMFS reasonably concluded that, while continued fishing would continue to adversely affect Acropora, at least some adverse effects would be mitigated by the Amendment's implementation. AR 10355. However, the BiOp also permissibly concluded that "even unfished populations of herbivores are unlikely to completely reverse the current phase shift due to the magnitude of other factors affecting reefs in the U.S. Caribbean." Id. It cannot be said that these determinations are capricious or arbitrary.

Plaintiffs counter that the BiOp's conclusions regarding the role of fishing in the phase shift are flawed because fishing pressure on parrotfish in Puerto Rico was heavy in the past. Docket # 51, p. 5. This argument lacks force, however. It is doomed, as Defendants correctly respond, by a critical finding: The record shows that NMFS looked not only at phase shift between the U.S. Caribbean islands, but also at macroalgal cover in and outside the Buck Island Reef National Monument, where fishing is prohibited. Notably, NMFS found no notable difference between macroalgal cover inside or outside the monument (e.g., U.S. Caribbean

²⁶Stopping short of advocating a total prohibition on parrotfish and surgeonfish, Plaintiffs conveniently remain silent as to what alternative fishing regime should be implemented. Regardless, the court agrees with Defendants that the ESA does not require action agencies to review alternative actions and adopt the action that will be most beneficial to the species. See Southwest Center for Biological Diversity v. U.S. Bureau of Reclamation, 143 F.3d 515, 523 (9th Cir. 1998) (noting that ESA does not require agency to select what the Plaintiffs may deem to be the "best" alternative or the one that would most effectively protect the species from jeopardy). As repeatedly made clear, it merely requires that agency action avoid jeopardy or adverse modification. And NMFS did just that here. Again, the Amendments should result in population increases of herbivorous fish throughout all three of the critical habitat units of Acropora in the Caribbean, AR 10354, which ultimately means that "there will be greater amounts of grazing under the proposed action than there were at the time of designation [of critical habitat], when parrotfish and surgeonfish harvests were unrestricted." AR 10355.

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Islands). Docket # 53, p. 3 n. 1(citing AR 10406). By like token, NMFS considered a survey in St. Croix from 2002-2008 that showed that algae cover was highest in 2003, the year with the lowest reported landings of both parrotfish and surgeonfish. AR 10347-48.²⁷ This suffices to conclude that the record belies Plaintiffs' challenge on this front.

Equally unavailing are Plaintiffs' averments that even "moderate" fishing pressure on herbivorous fish prevents them from grazing enough to mediate algal growth. See Docket # 44, pp. 14-15; Docket # 51, p. 13. As correctly responded by Defendants, these statements are unsupported by the record citations. The cited studies involved complete exclusion areas that segregated all adult parrotfish, AR 12849, or referred to undefined "intense fishing," AR 12162, or did not even discuss fishing, AR 12866. Once again, then, NMFS reasonably concluded that "even unfished populations of herbivores are unlikely to completely reverse the current phase shift due to the magnitude of the other factors affecting reefs in the U.S. Caribbean." AR 10354.

Undeterred, Plaintiffs claim that there is an inconsistency between the conclusion that herbivorous fish harvest is a moderate threat to Acropora and the conclusion that a reduction in this threat will reduce the adverse effects to Acropora. See Docket # 44, p. 18 ("Evidence in the administrative record directly undermines the BiOp's conflicting assumptions that herbivorous fish play only a moderate role in mediating algal growth but that modest increases in their biomass would nonetheless result in reduced algal growth."). While this argument has a superficial appeal, it is unavailing. That is so, because NMFS did not conclude, as the Plaintiffs appear to suggest, see Docket # 51, p. 14, that the increase in herbivorous fish biomass will inevitably lead to a decrease in macroalgal cover. Indeed, NMFS's declination to conclude that was in line with its general logic: The lack of correlation between the two, given the lack quantitative data, and because of the other, more significant factors affecting

²⁷Similarly, the record shows that in Puerto Rico algal coverage from 2002-2010 increased despite a decrease in parrotfish landings during that period. AR 10350. In St. John, a statistically significant increase in algal coverage occurred from 2002-2010, notwithstanding reductions in both parrotfish and surgeonfish landings during that same period. AR 10352.

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macroalgal growth. Nevertheless, the BiOp reasonably concluded that an increase in herbivorous fish biomass is anticipated to increase grazing, which in turn will potentially reduce the impacts of macroalgae on corals. AR 10418. These conclusions are not mutually exclusive; they are fully consistent with the best scientific information available. And while Plaintiffs point to contrary conclusions, they forget that “because the APA standard affords great deference to agency decisionmaking and because the Secretary’s action is presumed valid, judicial review, even at the summary judgment stage, is narrow.” Lovgren, 701 F.3d at 20-21 (quoting Assoc’d Fisheries of Me., 127 F.3d at 107).

Plaintiffs’ heavy reliance on Wild Fish Conservancy is mislaid. As Defendants easily point, there the agency knew that a hatchery’s continuing operation was the cause of the decline in the bull trout population, and that survival of the population depended on the fish’s ability to migrate upstream. 628 F.3d at 526; see also id. (noting that agency knew that “in order to stabilize or achieve a positive population growth trajectory in Icicle Creek, at least a few pairs of male and female migratory bull trout would probably need to successfully spawn in Icicle Creek annually”). The agency also knew that continued operation of the hatchery was likely “to at least reduce, and in some years preclude, demographic and genetic contributions by migratory bull trout to the small resident bull trout population in Icicle Creek.” Id. In fact, the agency had already determined that fish hatchery at issue in that case would “‘at least reduce, and in some years preclude’ migratory bull trout spawning. . . .” Id. at 527. Yet the agency concluded that the operation of the hatchery would not directly or indirectly reduce appreciably the likelihood of both the survival and recovery of the population, without reconciling the fact that annual upstream spawning is required and the fact that such spawning is likely to be precluded in some years. That is why the Ninth Circuit invalidated the agency’s conclusion that the continuation of the fish hatchery operations would not jeopardize the listed species, id. at 526, holding that those facts did not support the agency’s plainly contradictory conclusion that operational changes at the fish hatchery would improve in a “small” way the contribution of a local population of threatened bull trout to the survival of the species. See id. at 520, 528. So in Wild

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Fish Conservancy, “the bottom line of the Service’s findings is that as a result of the [challenged] action, the local bull trout population will continue to decline.” Id. at 528 (emphasis added).

Contrary to Plaintiffs’ argument, the facts in this case do not “closely parallel” those in Wild Fish Conservancy. Docket # 51, p. 14. Quite the opposite appears to be true. The key distinction is that in the instant case, NMFS permissibly predicts that implementation of the ACLs and AMs under the Amendments will increase the population of herbivorous fish and thereby increase grazing on algae, ultimately having the potential to reduce adverse affects on the Corals. AR 10354-55. Moreover, the best evidence available evidence demonstrates that myriad factors, mainly diseases, elevated sea surface temperature, damage from hurricanes, and the loss of Diadema, have joined forces to produce the phase shift that currently and adversely affects Acropora. This information also shows that herbivorous fish harvest has likely acted synergistically to exacerbate those factors. And while the data available did not allow NMFS to quantify the effects of herbivorous fish harvest, AR 10354, it did conclude that the Amendments would reduce, to some extent, those adverse affects. AR 10355. Accordingly, Plaintiffs’ reliance on Wild Fish Conservancy is misplaced.

Next, Plaintiffs posit that “the ESA does not permit NMFS to assume that continued fishing for herbivorous fish is not likely to result in jeopardy or adverse modification without knowing or specifying the actual level of habitat improvement or minimization of fishery impacts necessary to avoid jeopardy and adverse modification.” Docket # 44, p. 13. As concluded above, however, this kind of argument is unpersuasive, because NMFS simply had no quantitative data to reach such numbers.

But Plaintiffs’ argument also fails to persuade for other reasons. Most courts have held that a species’ recovery must be considered as part of the jeopardy and adverse modification analyses. See, e.g., Grand Canyon Trust v. U.S. Bureau of Reclamation, 691 F.3d 1008, 1023 (9th Cir. 2012), as amended (Sept. 17, 2012). The logic is that the ESA strives to ensure not only survival, but also make sure that the species recovers to the point that it can be delisted.

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Id. Survival and recovery, the Ninth Circuit recently reiterated, “are intertwined and are the complementary goals of the consultation process. Alaska v. Lubchenco, 723 F.3d 1043, 1054 (9th Cir. 2013) (citations omitted). Recovery means an “improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the [ESA].” 50 C.F.R. § 402.02.50. Importantly, however, “recovery impacts alone will not often prompt a jeopardy finding” National Wildlife, 524 F.3d at 933 (emphasis omitted). “Only ‘in exceptional circumstances’ could injury to recovery prospects result in a jeopardy finding.” Pac. Coast Fed’n of Fishermen’s Associations v. Gutierrez, 606 F. Supp. 2d 1195, 1213 (E.D. Cal. 2008) (citation and internal quotation marks omitted).

As to effects of the Amendments on the Coral’s survival, the BiOp stated that “[t]he proposed action is not anticipated to increase any of the major threats, and may reduce impacts from some of the moderate threats” — namely, reductions in harvest of parrotfish and surgeonfish are predicted to increase grazing over time. AR 10409. Nonetheless, and in line with NMFS’s conclusion that algal cover on reefs bears no correlation with fluctuations in fishing of herbivorous fish, NMFS acknowledged that “the continued harvest into the future will not result in any appreciable effects on macroalgal growth.” Id. So based on the available data concerning the effects of fishing and macroalgal growth, NMFS reasonably concluded that “[t]he proposed action is not anticipated to appreciably reduce the likelihood of survival in the wild for elkhorn and staghorn coral.” AR 10409.

Similarly, the BiOp fully considered the effects of the Amendments on *Acropora* recovery. Noting that the critical habitat has remained “functional” since the time of designation in 2009, NMFS concluded that the Amendments are not “appreciatively reducing capacity of critical habitat to provide an increased incidence of successful sexual/sexual reproduction (i.e., remain functional) currently or in the future.” AR10404. The BiOp further noted:

[A] very small reduction in numbers resulting from direct effects, and a reduction of sexual reproduction from macroalgae may result from the direct and indirect effects of the proposed action. However, the reduction in areal coverage is very

small and the ultimate result of the proposed action should lead to increases in grazing over time, thereby reducing the remaining effects of the proposed action and reducing the effects of macroalgae on sexual reproduction. Therefore, based on the evaluations above, we anticipate the proposed action will continue to have adverse effects on elkhorn and staghorn, but we do not anticipate those adverse effects on numbers and reproduction will appreciably reduce the likelihood of elkhorn and staghorn survival in the wild.

AR 10408.

While the BiOp states that “a draft recovery plan for elkhorn and staghorn is in preparation,” AR 1032, it notes that a “recovery team consisting of fishers, scientists, managers, and agency personnel from Florida, Puerto Rico, and USVI, and federal representatives has been convened and is working towards creating a draft recovery plan for public review based upon the latest and best available information.” AR 10321. Plaintiffs do not question this point — perhaps for good reason. Indeed, because the ESA does not establish a timetable for the production of the recovery plan, see, e.g., See Strahan v. Linnon, 967 F. Supp. 581, 597 (D. Mass. 1997) (holding that the ESA “places no time constraints on the development of recovery plans”), aff’d, 187 F.3d 623 (1st Cir. 1998), some courts have given agencies significant latitude in deciding when recovery plans are implemented. See id.; Oregon Natural Resource Council v. Turner, 863 F. Supp. 1277, 1282 (D. Or. 1994) (finding delay in development of recovery plan due to prioritization efforts was reasonable); see also 3 L. of Envtl. Prot. § 23:20 (updated Apr. 2013).

In this context, Plaintiffs cite National Wildlife for the proposition that “it is only logical to require that the agency know roughly at what point survival and recovery will be placed at risk before it may conclude that no harm will result from significant impairments to habitat that is already severely degraded.” 524 F.3d 917, 936 (9th Cir. 2008); but see Strahan, 967 F. Supp. at 597 (D. Mass. 1997) (“the fact that NMFS has not issued recovery plans . . . does not constitute a violation of [ESA] § 4(f).”). But Plaintiffs take this citation out of context. As a threshold matter, the species at issue in National Wildlife — salmon and steelhead fish — were previously found to be in a jeopardy condition. As correctly argued by Defendants, there

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has been no such findings here. Absent such determinations of imminent extinction, nothing prohibits NMFS from issuing the recovery plan — and thus making informed, point-of-recovery findings — once it gathers the necessary, relevant information. Cf. Friends of Blackwater v. Salazar, 691 F.3d 428, 436 (D.C. Cir. 2012) (holding that ESA does not requir[e] “that the criteria in a recovery plan be satisfied before a species may be delisted pursuant to the factors in the Act itself”).

In all events, the rough-analysis requirement of the point of survival (or recovery) must yield where, as here, the levels of habitat improvement — or minimization of the Fishery impacts necessary to achieve optimum survival and recovery — appear to be currently uncertain. See Greater Yellowstone Coal., Inc. v. Servheen, 665 F.3d 1015, 1028 (9th Cir. 2011) (“We recognize that scientific uncertainty generally calls for deference to agency expertise.” (citing Lands Council v. McNair, 537 F.3d 981, 993 (9th Cir. 2008))). Here, Defendants concede that the best scientific and commercial information available is insufficient to allow a determination as to the precise extent to which the harvest of herbivorous fish is adversely affecting macroalgal cover, AR 10406; it is currently impossible to quantify those effects. See AR 10356. Docket # 53, p. 5. They nevertheless submit that NMFS “did opine on the general direction of any such effects.” Id. Again, “NMFS concluded that any adverse affects on Acropora from continued fishing ‘are likely to be reduced by some amount that is currently unquantifiable.’” AR 10355. The court is satisfied with NMFS’s explanations that such an uncertainty counsels in favor of its chosen course of action. See Greater Yellowstone Coal., Inc., 665 F.3d at 1028.

Given the totality of the findings, Defendants reasonably concluded that the Amendments will not appreciatively reduce the likelihood of survival and recovery of Acropora or their critical habitat. “Under the APA’s deferential standard of review, agency action is presumed to be valid if there is a reasonable basis for the decision.” Conservation Cong., 720 F.3d at 1057-58. Although this is a closer call, Plaintiffs have failed to meet their burden of defeating that presumption.

3. The Environmental Baseline

The ESA requires that NMFS consider whether continued fishing herbivorous fish is likely to cause jeopardy or adverse modification when fishing impacts are added to the environmental baseline and analyzed in light of the current status of the species. 50 C.F.R. § 402.02, 402.14. The “environmental baseline” includes “the past and present impacts of all Federal, State or private actions and other human activities in the action area” and “the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early [S]ection 7 consultation.” *Id.* § 402.02.

In their last, core challenge to the BiOp’s no-jeopardy and no-adverse-modifications determinations, Plaintiffs argue that the BiOp failed to properly consider “the Fishery’s cumulative adverse impacts in the context of severe existing threats to the species and their habitat.” Docket # 44, p. 20. According to Plaintiffs, “the jeopardy analysis in the BiOp is fatally flawed because it fails to analyze the total impact of (1) the current action (removing parrotfish) ‘added to’ (2) other threats faced by elkhorn and staghorn corals, in light of (3) the status of those corals.” Docket # 44, p. 20. Plaintiffs specifically argue that “NMFS merely compared the current action with other existing threats, resulting in an analysis that assessed the comparative rather than the additive effect of removing parrotfish on the staghorn and elkhorn corals and their critical habitat.” Docket # 44, p. 16 (citing AR 10404). The court is unpersuaded.

At the outset, the court agrees with Defendants that Plaintiffs indeed “incorrectly characterize the manner in which NMFS analyzed the potential effects of the Amendments.” Docket # 47, p. 23. As Defendants correctly respond, the BiOp’s consideration of potential effects was “limited neither to comparative nor to additive effects.” Docket # 47, p. 23. Instead, NMFS considered the synergistic effects of harvesting herbivorous fish together with adverse effects posed by other anthropogenic and environmental factors, namely disease outbreaks, temperature-induced bleaching events, elevated sea surface temperature, damage from hurricanes, upland and costal activities that continue to degrade water quality and decrease

water clarity, dredge-and-fill activities, interactions with some fishing gears, vessel traffic, and poor diving and snorkeling techniques. AR 10307-10334.²⁸ In doing so, NMFS also documented the extensive declines in Acropora populations over the past three decades. AR 10307. This approach does not violate the ESA.

In this context, Defendants correctly call out Plaintiffs for incorrectly implying that the applicable baseline conditions here pose jeopardy to the Corals. Docket # 47, p. 2 (citing Docket # 44, p. 16). Despite the declines of Acropora documented in recent decades, the record reflects that “both elkhorn and staghorn coral have persisted at extremely reduced abundance levels (in most areas with quantitative data available, less than 3% prior abundance) for at least two decades.” AR 10277. And again, while NMFS recognized that the harvest of herbivorous fish is likely exacerbating the phase shift to algae-dominated reefs, NMFS also noted that this phase shift is equally severe in all three critical habitat units despite the higher harvest of these fish and smaller shelf off St. Croix. Therefore, the BiOp reasonably concluded that the proposed action appears to have only a small, incremental role in what is believed to be only a moderate threat to the species. AR 10403, 10406.

Plaintiffs attempt to shoehorn this case into National Wildlife, but that case is inapposite. There, a BiOp determined that river power system dam operations would not jeopardize threatened and endangered salmon populations or adversely modify their critical habitat. 524 F.3d at 925. NMFS, however, had already determined that baseline environmental conditions posed a risk of jeopardy to the species. Id. at 925. Although NMFS had determined that proposed operational changes would improve environmental conditions in relation to the existing operational regime, id. at 934, the district court disagreed, and the Ninth Circuit affirmed. Concluding that NMFS failed to consider the effects of the proposed action added to

²⁸See also, e.g., AR 10354 (“The anthropogenic effects from herbivorous fish harvest and nutrient input have likely acted synergistically to exacerbate those factors.”); AR 10403 (“We acknowledge that many factors have worked synergistically to reduce the amount of substrate suitable for successful Acropora reproduction.”); AR 10408 (“We acknowledge that many factors have worked synergistically to reduce the amount of substrate suitable for successful Acropora settlement.”).

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the underlying jeopardy baseline conditions, id. at 929, the court reasoned that “even where baseline conditions already jeopardize a species, an agency may not take action that deepens the jeopardy by causing additional harm.” Id. at 930.

The court also stressed that National Wildlife’s jeopardy conclusion was based on NMFS’s “novel ‘reference operation approach.’” Id. at 926. Instead of analyzing the effects of actual dam operations, NMFS used a hypothetical “reference operation” to redefine most ongoing operations as a “nondiscretionary” part of the baseline. Id. Disavowing this approach, the Ninth Circuit determined that NMFS had improperly conducted “the bulk of its jeopardy analysis in a vacuum” by comparing the proposed action “to the reference operation, rather than focusing its analysis on whether the action effects, when added to the underlying baseline conditions, would tip the species into jeopardy.” Id. at 929. Instead, the court held, NMFS had to incorporate the actual “degraded baseline conditions into its jeopardy analysis,” id. at 930, and “consider the proposed . . . operations in their actual context.” Id.

Contrary to National Wildlife, as Defendants persuasively maintain, the baseline conditions here do not present a risk of jeopardy to Acropora. Indeed, the record does not reflect that NMFS’s action in authorizing the fishery, including harvest of herbivorous fish at reduced levels, is causing a deterioration in Acropora’s pre-action condition. After all, National Wildlife itself teaches that because jeopardize means to “‘expose to loss or ‘injury’ or to ‘im peril,’ and because “either of these implies causation, . . . [there must be] some new risk of harm.” 524 F.3d 917, 930 (emphasis added). Thus, “agency action can only ‘jeopardize’ a species’ existence if that agency action causes some deterioration in the species’ pre-action condition.” Id. Quite the opposite appears to be true here, where NMFS concluded that, while the harvest of herbivorous fish will continue to adversely affect the Acropora and their critical habitat, such effects are likely to be reduced because of the ACLs and the prohibition on the harvest of the three large-bodied parrotfish. AR 10354-55, 10356. NMFS therefore permissibly predicts that the proposed action will improve conditions in relation to the baseline. Accord Ctr. for Biological Diversity v. U.S. Bureau of Land Mgmt., 746 F. Supp. 2d 1055, 1106 (N.D. Cal.

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2009) (construing National Wildlife), vacated in part, C 06-4884 SI, 2011 WL 337364 (N.D. Cal. Jan. 29, 2011). So, in short, because the Amendments present no “new risk of harm,” Plaintiffs’ unfair assertion, Docket # 44, p. 17, that BiOp’s determination leaves Acropora balanced on the “knife’s edge of jeopardy” is unpersuasive.

Moreover, in this case the BiOp did not compare the proposed action to any hypothetical “reference operation.” As Defendants correctly argue, NMFS evaluated whether the effects of the whole Fishery following implementation of the Amendments were likely to jeopardize the species or adversely modify their critical habitat. AR at 10400. In doing so, NMFS indeed acknowledged the degraded baseline conditions, and only then analyzed the effects of the proposed action, which includes continued harvest of herbivorous fish, in that context. AR 10402-409. And because the harvest of herbivorous fish is neither a primary threat to Acropora nor a primary contributor to the growth and spread of macroalgae, and because the proposed action should increase grazing relative to its current level, NMFS reasonably concluded that the proposed action would not “tip the species into jeopardy” or adversely modify their critical habitat.

By the same token, this case is similarly distinguishable from Blue Water Fishermen’s Ass’n v. Nat’l Marine Fisheries Serv., 226 F. Supp. 2d 330, 335 (D. Mass. 2002), another case cited by Plaintiffs in their attempt to undermine the BiOp’s baseline analysis. The short answer is that there, a BiOp had determined that any longline fishing posed a risk of jeopardy to loggerhead and leatherback sea turtles. See id. (noting that “longline activity could result in considerable diminution in the ‘numbers, reproduction and distribution’ of the leatherback turtle and the northern subpopulation of loggerheads, if not the entire loggerhead species”). But here, as said, NMFS never determined that the proposed action poses a risk of jeopardy to the Corals. Plaintiffs again invoke Wild Fish Conservancy, but the facts here are also distinguishable. As noted, in Wild Fish Conservancy, the BiOp failed to consider that the agency action at issue had direct, adverse effects contributing to further declines of the threatened bull trout. See 628 F.3d 513, 526. Here, however, the Amendments should contribute, even if incidentally, to increases

in algae grazing, which should reduce the adverse affects to the Corals and their critical habitat.
AR 10354-55.

Because NMFS properly included the entire environmental baseline in the agency action subject to review, and analyzed the effect of its actions within the context of other existing human activities, its analysis was neither distorted nor minimized. No more is exigible. Rejecting Plaintiffs' third assignment of error is rejected, summary judgment is entered in favor of Defendants.

To recapitulate, "faced with competing interests of theoretical accuracy and analytical uncertainty, . . . [NMFS] made . . . rational choice[s]." Alaska, 723 F.3d at 1055. The BiOp's conclusion that continued fishing under the Amendments is not likely to jeopardize the continued existence of Acropora coral or adversely modify their critical habitat is supported by the best available scientific information concerning the relative importance of herbivorous fish on the decline or recovery of Acropora. NMFS also supplied a rational nexus for this conclusion, which it reached by properly assessing the effects of the proposed action in relation to its degraded environmental baseline. The court refuses to second guess these reasonable determinations, which are supported by the record. "To conclude otherwise requires . . . distrusting agency experts' analysis of the scope and relevance of continued population decline, mitigated by remedial agency action." Wild Fish Conservancy, 628 F.3d at 537 (Fisher, J., concurring in part and dissenting in part).

C. Defendants Failed to Establish a Meaningful Trigger for Reinitiating Consultation on the Fishery's Effects Should Those Effects Exceed the Level Predicted by NMFS

The court now turns to the question whether NMFS acted arbitrarily and capriciously in establishing a trigger for reinitiating consultation on the Fishery's effects should those effects exceed the level predicted by NMFS.

An ITS, as indicated, sets forth a "trigger" that, when reached, an unacceptable level of incidental take results, "invalidating the safe harbor provision, and requiring the parties to re-initiate [Section 7] consultation." Arizona Cattle Growers' Ass'n v. U.S. Fish & Wildlife,

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Bureau of Land Mgmt., 273 F.3d 1229, 1249 (9th Cir. 2001); 50 C.F.R. § 402.14(i)(4) (“If during the course of the action the amount or extent of incidental taking ... is exceeded, the Federal agency must reinitiate consultation immediately.”); Strahan v. Roughead, 910 F. Supp. 2d 358, 375 (D. Mass. 2012). The ITS thus serves twin, vital purposes: Gauging conservation and monitoring take to ensure that the agency really does ensure against jeopardy and that any take that occurs is minimized. See 50 C.F.R. § 402.14(i). Here, ESA regulations make pellucid that “the prohibitions of [taking] . . . relating to endangered species apply to elkhorn (*Acropora palmata*) and staghorn (*A. cervicornis*) corals listed as threatened” 50 C.F.R. § 223.208 (a)(1). No one disputes, then, that because take of *Acropora* is likely in the first place, an ITS is required. See, e.g., Water Keeper Alliance, 271 F.3d at 26.

Plaintiffs say that the BiOp’s ITS violates the ESA for several reasons. Docket # 44, pp. 21-24. Plaintiffs first contend that NMFS should have specified a quantitative trigger for determining when reinitiation of ESA consultation would be necessary in the event that Amendments do not lead to improved stocks of herbivorous fish as anticipated. Docket # 51, p. 22. According to Plaintiffs, “NMFS failed to adequately explain why establishing a numerical take limit for the Fishery’s indirect effects in promoting algal growth was not practicable.” Id. While this argument carries some weight, it fails to persuade.

The short answer is that, as properly pointed out by Defendants, nothing requires that NMFS provide a precise number of corals — or other threatened or endangered species — that may be incidentally taken by the proposed activity.” True enough, courts have held that this trigger should “ideally . . . be a specific number.” Arizona Cattle Growers’ Ass’n, 273 F.3d at 1249; accord, e.g., Miccosukee Tribe of Indians of Fla., 566 F.3d at 1274-75. But ideally is not the same as obligatory, which is why courts have “never held that a numerical limit is required.” Id.²⁹ “In the absence of a specific numerical value, however, the [Defendants] must

²⁹See also, e.g., Pac. Nw. Generating Coop v. Brown, 822 F. Supp. 1479, 1510 (D. Or. 1993) (“Plaintiffs’ claim that the incidental take statements are facially invalid for failing to identify specific impacts (i.e. an anticipated number of listed species to be harvested) is belied by clear legislative history

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establish that no such numerical value could be practically obtained.” Arizona Cattle Growers’ Ass’n, 273 F.3d at 1250. Only then may NMFS “utilize[] a surrogate instead of a numerical cap on take.” Or. Natural Res. Council v. Allen, 476 F.3d 1031, 1037 (9th Cir. 2007).

Here, the BiOp quantifies direct Acropora takes (destruction of elkhorn and staghorn corals) from trap damage by considering the area of coral habitat affected. AR 10417.³⁰ NMFS, however, explained that it “cannot quantitatively determine how much elkhorn and staghorn coral will be indirectly affected,” AR 10417, maintaining that it was impractical to determine the number of Acropora individuals that may be incidentally taken by the implementation of the Amendments. Id. “Since the polyps that make up elkhorn and staghorn corals are so small,” the BiOp reasoned, “monitoring impacts to a single polyp would be exceptionally difficult.” Id.³¹

While NMFS’s explanations regarding the feasibility of providing a specific numeric estimate of take under the ESA could have been more thorough, they suffice. The BiOp sufficiently “explain[s] why it was impracticable to express a numerical measure of take.” Or. Natural Res. Council v. Allen, 476 F.3d 1031, 1037 (9th Cir. 2007); see id. at 1038 (finding that BiOp violates ESA where it “offers no explanation of why [NMFS] was unable numerically to quantify the level of take.”). Compare, e.g., Miccosukee Tribe of Indians of Florida, 566 F.3d at 1275 (finding unpersuasive agency’s explanation that it was impractical to provide numerical measure of take when record revealed that agency’s scientists spend “significant” amount of time counting the species and creating yearly population data based on such information).

which demonstrates that Congress fully anticipated that there would be occasions when impacts would have to be estimated.”) (citations omitted), aff’d 38 F.3d 1058 (9th Cir. 1994)

³⁰Plaintiffs do not quarrel with this choice. See Docket # 44, p. 24. Nor do Plaintiffs take issue with the BiOp’s determination to use a “three-year time period” for monitoring take estimates. AR 10416. Such agency actions are therefore presumed valid. See, e.g., Visiting Nurse Ass’n Gregoria Auffant, Inc. v. Thompson, 447 F.3d 68, 72 (1st Cir. 2006).

³¹See also AR 10417 (explaining that because Acropora “are branching, colonial species, that use asexual reproduction to propagate, determining discrete individuals is impossible without individual genetic identification, which is also impractical . . .”).

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In any event, NMFS's explications are also "supplemented by the explanation elsewhere in the BiOp," Ctr. for Biological Diversity v. Salazar, 695 F.3d 893, 913 (9th Cir. 2012) — namely the BiOp's determinations that the incremental impact that herbivorous fish harvest has on the availability of suitable coral substrate is "uncertain and currently unquantifiable," AR 10347-5, and that, consequently, the extent of algal cover on reefs does not appear to correlate with fluctuations in harvests of herbivorous fish. See generally AR 10347-53.³² By parity of reasoning, these determinations also justify why NMFS declined to measure macroalgal growth directly, AR 10418, as Plaintiffs apparently would want. Docket # 44, p. 24.

This does not end the matter, however. The burden now shifts to NMFS to (1) show that the "chosen surrogate . . . [can] perform the functions of a numerical limitation by set[ting] forth a trigger that, when reached, results in an unacceptable level of incidental take . . . and requir[es] the parties to re-initiate consultation," Salazar, 695 F.3d at 912 (quoting Allen, 476 F.3d at 1037) (internal quotation marks omitted); and (2) "articulate a rational connection between the surrogate and the taking of the species." Wild Fish Conservancy, 628 F.3d at 531. (citation omitted).

Monitoring herbivorous fish biomass, the BiOp concluded (and Defendants now submit), provides a meaningful proxy for incidental take of Acropora, because it "is a better metric for judging whether the proposed action is ultimately leading to an increase in grazing, and whether excessive indirect take of Acropora is occurring as a result of the harvest of herbivorous fishes." AR 10418; Docket # 47, p. 25 (citing AR 10417); see also AR 10418 (noting that "monitoring the factors that affect the amount of substrate suitable for coral larvae settlement and fragment reattachment is appropriate"). Defendants also emphasize that "NMFS elected to monitor biomass levels because '[g]iven current funding levels and programs, the ability to monitor any

³²After all, judicial review under the APA is based on the "whole record." 5 U.S.C. § 706, and there is "no requirement that every detail of the agency's decision be stated expressly in the [BiOp]" as long as the "rationale is present in the administrative record underlying the document." In re Operation of Mo. River Sys. Litig., 421 F.3d 618, 634 (8th Cir.2005) (citations omitted).

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response relies on fishery dependent information.” Docket # 47, p. 25 (citing AR 10510; Supp. AR. 25633). The BiOp then determined that because data on number and biomass of herbivorous fish do not currently exist, “it is impractical to try and estimate what changes in these metrics represent a decline over time” for purposes of establishing a trigger for potentially reinitiating Section 7 consultation (the reinitiation trigger). AR 10418. Instead, NMFS specified a framework for making estimates of changes in herbivorous fish populations over time based on monitoring requirements. Id. The BiOp also states that NMFS will monitor the biomass of herbivorous fish during consecutive three-year periods to insure that it is not decreasing. Id. at 10418-19.

All this brings us to Plaintiffs’ next (and strongest) argument: NMFS’s decision to use biomass as the proxy or surrogate for measuring the status of herbivorous fish stock is arbitrary and capricious See Docket # 44, p. 25. Arguing that because monitoring the biomass of an “unspecified suite of herbivorous fish” does not provide a “reliable indicator of the Fishery’s effects,” Plaintiffs maintain that this decision is supported neither by the BiOp’s own statements nor by the best available science. Docket # 51, p. 22; Docket # 44, p. 26. The Court agrees with Plaintiffs, and Defendants do not fare as well on this point.

To begin with, and as persuasively observed by Plaintiffs, Docket # 44, p. 23, it catches the eye that the BiOp contains no baseline estimate of herbivorous fish biomass. In pithier terms, the BiOp has no measure against which any future changes can be measured. NMFS’s admission that the BiOp does not establish a reinitiation trigger — despite the ESA’s requirement that it do so — thus comes as no surprise. AR 10418. As correctly argued by Plaintiffs, however, this approach violates the ESA; NMFS cannot choose a proxy that it cannot measure. See Az. Cattle Growers Ass., 273 F.3d at 1250 (incidental take statement must provide some way to measure effects and determine whether the action is complying with the incidental take limit); Allen, 476 F.3d at 1041 (“invalidat[ing] Incidental Take Statements that could not adequately trigger reinitiation of consultation”). So Plaintiffs are right that the chosen surrogate is too vague and provides no viable method to detect the Fishery’s effects. Nor does it provide

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a measurable way to detect whether the effects of the Fishery have exceeded those anticipated by the BiOp. Tellingly, as Plaintiffs aptly note, see Docket # 51, p. 22 n. 4, Defendants fail entirely to respond to this argument. Defendants' silence is a testament to the merits of this contention. Because NMFS cannot measure changes in herbivorous fish biomass when it ignores what that biomass is to begin with, the chosen surrogate is so vague that it cannot "provide a clear standard for determining when the authorized level of take has been exceeded" Wild Fish Conservancy, 628 F.3d at 531 (quoting Allen, 476 F.3d at 1251). The upshot is that, because this standard provides no way for gauging compliance, the chosen surrogate cannot perform the functions of a numerical limitation. See Salazar, 695 F.3d at 912.³³

Even putting that flaw aside, the court also agrees with Plaintiffs that the BiOp nevertheless fails to articulate a rational connection between the surrogate and the taking of Acropora. The ITS's terms and conditions require only that NMFS monitor the "most abundant" herbivorous fish species "without regard to whether or not the most abundant species are the most critical for controlling macroalgal growth." Docket # 44, p. 26 (citing AR 10421). And, as correctly noted by Plaintiffs, the scientific consensus is that different types of herbivorous fish have very different "feeding strategies": Some species simply crop thin, filamentous algae, while others (like parrotfish) remove larger algae or scrape substrate clear of all algae, "making it available for coral recruitment." Id. (citing AR 1462-71, 11260-64, 13042-44). These scientific findings highlight the broadness of the chosen surrogate. See Wild Fish Conservancy, 628 F.3d at 531 ("This court has rejected a surrogate trigger . . . so broad — 'all spotted owls' associated with the project — that it 'could not adequately trigger reinitiation of consultation.'" (quoting Allen, 476 F.3d at 1038)). So as a general matter, the court agrees with Plaintiffs that

³³While the BiOp's terms and conditions require that NMFS develop a baseline estimate of herbivorous fish biomass more than a year after NMFS has already implemented the Amendments AR 10421, this guarantee is insufficient to insulate NMFS from complying with its duty under Section 9. Cf. Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv., 378 F.3d 1059, 1077, amended, 387 F.3d 968 (9th Cir. 2004) ("As a general rule, such 'updates' are prohibited because they would render the consultation process 'meaningless . . .'" (quoting Ariz. Cattle Growers' Ass'n, 273 F.3d at 1245)).

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NMFS's choice to monitor the most abundant herbivores fails to provide a "meaningful opportunity for revived consultation." Center for Biological Diversity v. Provencio, No. CV 10-330, 2012 WL 966031, at * 15 (D.Ariz. Jan. 23, 2012) (citation omitted); see Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv., 378 F.3d 1059, 1066, amended, 387 F.3d 968 (9th Cir. 2004) (stating that the "test for whether a habitat proxy is permissible . . . is whether it reasonably ensures that the proxy results mirror reality") (internal quotation marks omitted); Allen, 476 F.3d at 1038-39 (surrogate must be "able to perform the functions of a numerical limitation," namely contain "measurable guidelines to determine when incidental take would be exceeded" and "not be so general that the applicant or the action agency cannot gauge its level of compliance").

The court now moves from the general to the specific. NMFS acknowledges that parrotfish play a unique role in removing fleshy macroalgae, and that their role cannot be filled by other herbivorous fish species or by the still-scarce Diadema. AR 8744. Yet, as concluded above, the terms and conditions established to implement the ITS do not require that NMFS monitor the biomass of any specific herbivorous fish species — like parrotfish. This omission is most troubling because, as Plaintiffs correctly remind, parrotfish (and surgeonfish to a lesser extent) "are the very focus of the proposed action and their harvest results in the adverse effects on staghorn and elkhorn coral that the BiOp describes." Docket # 44, p. 26. Indeed, the BiOp even concedes that "if the qualitative guidance on the likely population responses of herbivorous fishes is incorrect, we risk having (1) overestimated the reduction in indirect effects, (2) underestimated the potential adverse effect to Acropora, (3) and possibly reached the incorrect conclusion in our jeopardy analysis." AR 10420 (emphasis added).³⁴

³⁴In their reply, Defendants counter that "NMFS is not relying solely on monitoring of herbivorous fish biomass to assess the effects of Amendments 5 and 6. The biological opinion also includes among its 'terms and conditions' a requirement that NMFS continue to monitor the results of ongoing surveys concerning the percent cover of: (1) scleractinian and soft corals; (2) macroalgae; (3) turf algae; and (4) bare substrate." Docket # 52, p. 10 (citing AR 10422). While these, other monitoring mechanisms are undoubtedly a step forward in protecting Acropora, this argument misses the forest for

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As said, the BiOp decided to monitor undifferentiated herbivorous fish, which, as Plaintiffs aptly point out, could include parrotfish and surgeonfish managed under the Fishery “but could also include unmanaged species like damselfish.” *Id.* (citing AR 10421). The fatal flaw here, then, is that the ITS’s surrogate focuses only on general segments of herbivorous fish but fails to consider those crucial segments that most profoundly affect *Acropora*. *Cf. Grand Canyon Trust v. U.S. Bureau of Reclamation*, No. CV-07-8164, 2010 WL 2643537, at *22-23 (D. Ariz. June 29, 2010) (rejecting the use of an ecological surrogate in a biological opinion where agency failed to show why the consultation trigger for adult members of a listed species of fish accurately measured the take of young members of the species and failed to identify the level at which the take of the young members would become excessive).³⁵ By like token, BiOp’s reliance on biomass as a proxy for the grazing efficacy of herbivorous fish also fails to take into account and establish any trigger for reconsultation based on the size of herbivorous fish. As concluded, scientific studies also show that the size of fish has a key role in determining their grazing efficacy. Indeed, the record shows (and Defendants do not dispute) that the size structure of a fish is an essential factor in determining whether it can effectively mediate competition between macroalgae and coral. AR 10991-97, 11260-64, 12880-86. Large-bodied fish are more effective algae grazers than their smaller counterparts. *Id.*³⁶ Because measuring biomass does not account for the fact that larger grazing fish are needed to regulate macroalgal growth and minimize the effect of that growth on *Acropora*, the chosen surrogate fails to accurately measure the level of allowable take. *See Az. Cattle Growers Assn.*, 273 F.3d at 1250

the trees: Such measurements and reporting requirements were not designated as alternative surrogates, and thus do nothing to provide alternate triggers to measure take. *Cf. Wild Fish Conservancy*, 628 F.3d at 532.

³⁵See generally Jason Totoiu, *Quantifying, Monitoring, and Tracking ‘Take’ Under the Endangered Species Act: The Promise of a More Informed Approach to Consultation*, 41 *Envtl. L.* 165, 179 (2011) (describing this kind of risks associated with the use of surrogates).

³⁶Indeed, the BiOp itself observes that parrotfish populations are already dominated by smaller fish because of overfishing. AR 10347, 10349, 10353.

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(incidental take proxy must be based on data that links changes in habitat characteristics or other metric to take of listed species).

Finally, Plaintiffs criticize NMFS for not requiring assessment of biomass in Puerto Rico and St. Thomas/St. John as well as St. Croix. Docket # 51, p. 24. Defendants respond that “NMFS elected to monitor biomass in St. Croix specifically, because this is the only area where NMFS anticipated a detectable herbivorous fish population response. AR 10420. In Puerto Rico and St. Thomas/St. John parrotfish are not strongly targeted, making reductions in landings less likely to significantly change stock size.” Docket # 47, p. 25. In their reply, Defendants further explain that “given its available funding levels and programs,” NMFS elected to monitor biomass only in St. Croix. Docket # 53, p. 10 (citing AR 10420; AR 25622-23).

At first blush, and given the deference owed to NMFS, these explanations appear to be reasonable. But Plaintiffs rightly point to NMFS’s admission that the Fishery will continue to degrade Acropora habitat “in Puerto Rico and St. Thomas/St. John,” Docket # 51, p. 24 (citing, *inter alia*, 10351), and that “this continued habitat degradation will result in incidental take throughout all three island areas.” *Id.* (citing AR 10407, 10421). That NMFS admitted that such take will occur, would normally result in the agency having to monitor that take. Still, given Defendants’ explanations, this shortcoming, without more, should not result in the ITS’s invalidation. But when added together to the other flaws discussed above, it tips the scale in favor of Plaintiffs.

An ITS trigger must provide a meaningful chance for renewed consultation. Because the chosen surrogate is both vague and broad, it cannot accurately measure the level of allowable take. For these and other reasons stated above, the ITS is therefore inadequate. This is particularly true here, where although NMFS admits uncertainty regarding whether any increase in herbivorous will have a check on algal growth, it still bases its no-jeopardy and no-adverse-modifications determinations on the supposition that stocks will “increase as anticipated” AR 10421. A contrary conclusion would insulate NMFS from meaningful check on its own assumptions and predictions. Plaintiffs are entitled to summary judgment on their third claim.

D. Defendants Failed to Comply with Their Duty to Ensure that the Fishery Would Not Jeopardize Acropora or Adversely Modify Critical Habitat

Plaintiffs have one last arrow in their quiver. Apart from challenging the merits of the BiOp issued by NMFS's Office of Protected Resources (the consulting agency), Plaintiffs argue that, by relying on the BiOp's arbitrary and capricious determinations, NMFS's Office of Sustainable Fisheries (as the Fishery's operator) also violates its duty under ESA Section 7 — namely ensuring that the Fishery's continued operations are not likely to jeopardize the continued existence of Acropora or adversely modify their critical habitat. Docket # 44, p. 25. Betting the house on the BiOp's survival of Plaintiffs last three challenges, Defendants opposed. Docket # 53, p. 10. Because Plaintiffs are clearly entitled to summary judgment on this front, the court need not tarry long here.

By "arbitrarily and capriciously relying on a faulty Biological Opinion," courts have repeatedly held, agencies violate the aforementioned duty. Wild Fish Conservancy, 628 F.3d at 532 (quoting Defenders of Wildlife v. EPA, 420 F.3d 946, 976 (9th Cir. 2005)); Ctr. for Biological Diversity v. U.S. Bureau of Land Mgmt., 698 F.3d 1101, 1127 (9th Cir. 2012). "An agency's reliance on a biological opinion based on 'admittedly weak' information satisfies its ESA obligations as long as the challenging party can point to no new information undercutting the opinion's conclusions." Id. (quoting Pyramid Lake Paiute Tribe of Indians v. U.S. Dep't of Navy, 898 F.2d 1410, 1415 (9th Cir.1990)). When the BiOp's "flaws are legal in nature, however, "[d]iscerning them requires no technical or scientific expertise, and the failure to do so may result in an action based on reasoning not in accordance with law and . . .thus arbitrary and capricious." Id. (citation and internal quotation marks omitted).

In the case at hand, NMFS "committed legal error" when it issued a BiOp with "an inadequate incidental take statement." Id. Because the reliance of NMFS's Office of Sustainable Fisheries "on a legally flawed biological opinion was arbitrary and capricious," id., it follows that this agency violated its substantive duty to ensure that the continued operation of the Fishery

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did not jeopardize the continued existence of elkhorn and staghorn. See id. Plaintiffs' cross-motion for summary judgment is therefore **GRANTED** on this count, while Defendants' is **DENIED**.

Conclusion

Last year, this court proclaimed that "it will do everything in its power" to ensure compliance with environmental laws. Water Quality Prot. Coal. v. Municipality of Arecibo, 858 F. Supp. 2d 203, 213 (D.P.R. 2012). That statement applies with equal force today. "The protection of the environment deserves nothing less." Id. In this sense, the court's sympathy lies with Plaintiffs. They stand up for important but often-neglected issues — like protecting Acropora. Some of the alternatives and recommendations proposed by Plaintiffs even appear to be quite sensible. But sympathy alone cannot carry the day, and the law does not entitle Plaintiffs to everything they seek.

After carefully considering the administrative record, together with the pleadings and the parties' dispositive motions, the court finds that Plaintiffs fall short of shouldering their heavy burden of rebutting the presumption that the BiOp's no-jeopardy and no-adverse-modification conclusions were neither arbitrary nor capricious. While some of Plaintiffs' criticisms are not without force, the administrative record as a whole does not demonstrate that this particular agency action — reduced levels of fishing under the Amendments — jeopardizes Acropora or adversely modifies their critical habitat. The record merely shows that NMFS made difficult choices among competing but nevertheless rational alternatives. To boot, the Amendments do not even create a new jeopardy; they are aimed at alleviating overfishing.³⁷ As to the assumptions and predictions reached by NMFS, the limited quantitative and statistical data strongly calls for considerable caution and deference to the agency's scientific evaluations and technical expertise. Deference retains even more bite here, where NMFS's issued a comprehensive, elaborate biological opinion notwithstanding the technological uncertainty and other challenges it faced.

³⁷This is true, of course, relative to the pre-action level and the status quo level of parrotfish and surgeonfish.

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One last point. Given the rapidly evolving science at issue here and the inevitable emergence of better quantitative data, future BiOps could well find that the continued operation of the Fishery and the harvesting of parrotfish will push Acropora to a tipping point.³⁸ But, for the reasons stated, the 2011 BiOp provides a rational explanation why this particular action will not increase the likelihood that such a point will be reached. Upholding NMFS's reasonable conclusions on this front, the court declines Plaintiffs' thinly-veiled invitations to direct NMFS in a choice between rational alternatives. Defendants are therefore entitled to summary judgment on Plaintiffs' first two claims.

The ESA requires more, however. The BiOp's ITS had to include an adequate trigger for reconsultation. And here is where Plaintiffs prosper. While the court defers to NMFS's explanations regarding the impracticability of setting a numerical take, it cannot uphold NMFS's chosen surrogate; it is inadequate, so it must be modified or repealed. Because Plaintiffs are entitled to summary judgment on this count, the BiOp's ITS is **REMANDED** to NMFS for reconsideration consistent with this opinion. By November 11, 2013, Defendants shall file a motion proposing a timetable for ITS revision.

Lastly, because NMFS committed legal error when it issued a BiOp with an inadequate ITS, the reliance of NMFS's Office of Sustainable Fisheries on a legally flawed biological opinion was arbitrary and capricious. It follows that this agency violated its substantive duty to ensure that the continued operation of the Fishery did not jeopardize the continued existence of elkhorn and staghorn. Plaintiffs are also entitled to summary judgment on this score.

³⁸See, e.g., *Am. Rivers v. Nat'l Marine Fisheries Serv.*, 126 F.3d 1118, 1123-24 (9th Cir.1997) (holding that new biological opinion generally renders moot any challenges to the validity a previous one).

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For the reasons stated, each party's cross-motion for summary judgment is **GRANTED**
in part and DENIED in part.

IT IS SO ORDERED.

In San Juan, Puerto Rico, this 30th day of September, 2013.

S/Salvador E. Casellas
SALVADOR E. CASELLAS
U.S. Senior District Judge